

Online Supplemental Tables

The following tables of computational model output correspond to the figures in the King *et al.* paper, *A community benchmark for 2D Cartesian compressible convection in the Earth's mantle.*

Code	Resolution	Ra	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$
UM	60x68r	10^4	4.8800	42.9000	61.6000	41.4000	0.5000
VT	64x64	10^4	4.8900	43.0300	61.6000	41.4000	0.5000
CU	64x64r	10^4	4.8800	42.9000	61.7000	41.4000	0.5002
CT	64x64	10^4	4.8869	42.8921	61.6623	41.4334	0.5000
CZ	70x70r	10^4	4.8600	43.2100	62.1700	41.7600	0.5000
KS	128x128	10^4	4.8814	42.8450	61.5900	41.3980	0.5000
Best Estimate		10^4	4.8844	42.8650			
UM	60x68r	2×10^4	6.1900	68.2000	97.1000	67.3000	0.5000
VT	64x64	2×10^4	6.2000	68.6100	97.1800	67.1000	0.5000
CU	64x64r	2×10^4	6.1900	68.3000	97.2000	67.3000	0.5002
CT	64x64	2×10^4	6.2011	68.2763	97.1841	67.3052	0.5000
CZ	70x70r	2×10^4	6.1600	68.8400	98.0300	67.9000	0.5000
KS	128x128	2×10^4	6.1893	68.1750	97.0470	67.2220	0.5000
UM	60x68r	5×10^4	8.3800	123.9000	173.3000	125.1000	0.5000
VT	64x64	5×10^4	8.4100	124.8300	173.2700	125.1700	0.5000
CU	64x64r	5×10^4	8.3900	123.9000	173.2000	125.1000	0.5002
CT	64x64	5×10^4	8.4111	123.9547	173.2740	125.1729	0.5000
CZ	70x70r	5×10^4	8.3500	125.0200	174.8400	126.3800	0.5000
KS	128x128	5×10^4	8.3846	123.7300	173.0000	124.9600	0.5000
UM	60x68r	10^5	10.4900	193.3000	266.4000	198.2000	0.5000
VT	64x64	10^5	10.5400	195.0800	266.3700	198.2800	0.5000
CU	64x64r	10^5	10.5000	193.4000	266.3000	198.2000	0.5001
CT	64x64	10^5	10.5421	193.4284	266.3764	198.2904	0.5000
CZ	70x70r	10^5	10.4600	195.0000	268.6100	200.2200	0.5000
KS	128x128	10^5	10.4950	192.8700	265.7400	197.7600	0.5000
Best Estimate		10^5	10.5340	193.2150			
UM	60x68r	2×10^5	13.0800	300.5000	408.5000	311.9000	0.5000
VT	64x64	2×10^5	13.1900	300.9600	408.7900	312.2800	0.5000
CU	64x64r	2×10^5	13.1000	300.8000	408.5000	312.0000	0.5002
CT	64x64	2×10^5	13.1814	300.9805	408.7873	312.2900	0.5000
CZ	70x70r	2×10^5	13.0600	303.1400	411.7800	315.2100	0.5000
KS	128x128	2×10^5	13.0890	299.5700	407.0800	310.9000	0.5000
UM	60x68r	5×10^5	17.4300	537.3000	718.9000	564.2000	0.5000
VT	64x64	5×10^5	17.6400	538.9808	720.5100	565.6900	0.5000
CU	64x64r	5×10^5	17.4700	538.2000	719.5000	564.8000	0.5002
CT	64x64	5×10^5	17.6568	538.9814	720.4860	565.6980	0.5000
CZ	70x70r	5×10^5	17.0700	542.8700	726.3500	571.4900	0.5000
KS	128x128	5×10^5	17.4420	537.4900	714.9600	561.1600	0.5000
UM	60x68r	10^6	21.5900	834.0000	1104.4000	880.8000	0.5000
VT	64x64	10^6	22.0200	838.0237	1108.7000	884.5200	0.5000
CU	64x64r	10^6	21.6400	836.1000	1106.3000	882.5000	0.5002
CT	64x64	10^6	21.9848	838.0348	1108.6764	884.5452	0.5000
CZ	70x70r	10^6	21.0400	842.7800	1116.2700	892.5100	0.5000
KS	128x128	10^6	21.6040	827.4300	1095.6000	873.7900	0.5000
Best Estimate		10^6	21.9720	833.9900			

*Best Estimate comes from the extrapolation of Christensen's results

Table 1. Comparison of incompressible steady-state results with Blankenbach *et al*, 1989 case 1a,b,c.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	0.25	4.0900	38.4000	54.9000	36.6000	0.4912	0.0000	0.0000
VT	64x64	10^4	0.25	4.0957	38.4761	54.8969	36.5988	0.4912	0.7735	0.7736
CU	64x64r	10^4	0.25	4.0900	38.5000	54.9000	36.6000	0.4914	0.7739	0.7746
CT	64x64	10^4	0.25	4.0839	38.4782	54.8989	36.6003	0.4911	0.7316	0.7736
CZ	70x70r	10^4	0.25	4.0463	38.3905	54.7793	36.5127	0.4909	0.7689	0.7692
KS	128x128	10^4	0.25	4.0924	38.4340	54.8310	36.5680	0.4912	0.7723	0.7723
UM	60x68r	2×10^4	0.25	5.1500	61.4000	86.9000	59.6000	0.4940	0.0000	0.0000
VT	64x64	2×10^4	0.25	5.1627	61.4697	86.9552	59.6169	0.4940	1.0402	1.0403
CU	64x64r	2×10^4	0.25	5.1600	61.5000	86.9000	59.6000	0.4942	1.0406	1.0416
CT	64x64	2×10^4	0.25	5.1473	61.4731	86.9575	59.6190	0.4939	0.9819	1.0403
CZ	70x70r	2×10^4	0.25	5.1009	61.3475	86.8006	59.5036	0.4937	1.0340	1.0346
KS	128x128	2×10^4	0.25	5.1554	61.3750	86.8280	59.5420	0.4940	1.0374	1.0375
UM	60x68r	5×10^4	0.25	6.9200	111.7000	155.6000	110.9000	0.4994	0.0000	0.0000
VT	64x64	5×10^4	0.25	6.9479	111.7275	155.6737	110.9542	0.4994	1.4856	1.4857
CU	64x64r	5×10^4	0.25	6.9400	111.7000	155.6000	110.9000	0.4996	1.4855	1.4872
CT	64x64	5×10^4	0.25	6.9273	111.7340	155.6739	110.9570	0.4993	1.3991	1.4858
CZ	70x70r	5×10^4	0.25	6.8592	111.4951	155.3975	110.7583	0.4987	1.4762	1.4775
KS	128x128	5×10^4	0.25	6.9295	111.4800	155.3500	110.7300	0.4994	1.4792	1.4796
UM	60x68r	10^5	0.25	8.6100	174.0000	239.7000	175.5000	0.5044	0.0000	0.0000
VT	64x64	10^5	0.25	8.6552	174.2047	239.6164	175.5369	0.5044	1.9121	1.9123
CU	64x64r	10^5	0.25	8.6300	174.1000	239.6000	175.5000	0.5045	1.9113	1.9142
CT	64x64	10^5	0.25	8.6293	174.0695	239.6056	175.5366	0.5043	1.7975	1.9124
CZ	70x70r	10^5	0.25	8.5399	173.6184	239.1003	175.1994	0.5033	1.8987	1.9011
KS	128x128	10^5	0.25	8.6235	173.4800	238.9400	175.0000	0.5042	1.9000	1.9008
UM	60x68r	2×10^5	0.25	10.6600	269.0000	367.2000	274.9000	0.5100	0.0000	0.0000
VT	64x64	2×10^5	0.25	10.7440	269.5349	367.2721	275.1416	0.5101	2.4345	2.4348
CU	64x64r	2×10^5	0.25	10.6800	269.2000	367.1000	275.0000	0.5101	2.4315	2.4366
CT	64x64	2×10^5	0.25	10.7085	269.3093	367.2236	275.1355	0.5099	2.2841	2.4348
CZ	70x70r	2×10^5	0.25	10.5824	268.3580	366.0335	274.4638	0.5083	2.4122	2.4164
KS	128x128	2×10^5	0.25	10.6780	267.8600	365.4500	273.8200	0.5095	2.4086	2.4101
UM	60x68r	5×10^5	0.25	13.8900	465.0000	635.2000	482.2000	0.5175	0.0000	0.0000
VT	64x64	5×10^5	0.25	14.0705	466.8143	635.8812	483.0582	0.5178	3.2679	3.2686
CU	64x64r	5×10^5	0.25	13.9500	466.6000	636.0000	483.4000	0.5176	3.2631	3.2736
CT	64x64	5×10^5	0.25	14.0176	466.2030	635.8080	483.1540	0.5174	3.0586	3.2685
CZ	70x70r	5×10^5	0.25	13.8836	465.0651	633.8841	483.0812	0.5168	3.2248	3.2333
KS	128x128	5×10^5	0.25	13.9630	464.9600	632.6800	482.3500	0.5161	3.2175	3.2207
UM	60x68r	10^6	0.25	15.4000	588.7000	841.9000	619.4000	0.5184	0.0000	0.0000
VT	64x64	10^6	0.25	15.5286	584.5324	836.2587	614.6880	0.5187	3.6432	3.6443
CU	64x64r	10^6	0.25	15.3800	585.1000	836.5000	615.0000	0.5189	3.6360	3.6557
CT	64x64	10^6	0.25	no convergence to steady state						
CZ	70x70r	10^6	0.25	no convergence to steady state						
KS	128x128	10^6	0.25	16.4660	658.9200	914.9200	691.2900	0.5185	3.8293	3.8351

Table 2. Steady-state extended Bousinesq results, $Di = 0.25$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	0.5	3.3700	33.9000	48.0000	31.8000	0.4822	0.0000	0.0000
VT	64x64	10^4	0.5	3.3827	33.9177	48.0882	31.7990	0.4821	1.1890	1.1891
CU	64x64r	10^4	0.5	3.3800	33.9000	48.1000	31.8000	0.4823	1.1896	1.1905
CT	64x64	10^4	0.5	3.3643	33.9205	48.0899	31.8003	0.4820	1.1253	1.1892
CZ	70x70r	10^4	0.5	3.3347	33.7603	47.8664	31.6457	0.4816	1.1762	1.1767
KS	128x128	10^4	0.5	3.3804	33.8790	48.0330	31.7710	0.4821	1.1870	1.1870
UM	60x68r	2×10^4	0.5	4.2100	54.4000	76.5000	51.9000	0.4860	0.0000	0.0000
VT	64x64	2×10^4	0.5	4.2200	54.4078	76.5601	51.9394	0.4859	1.6067	1.6068
CU	64x64r	2×10^4	0.5	4.2200	54.4000	76.6000	51.9000	0.4861	1.6074	1.6088
CT	64x64	2×10^4	0.5	4.1958	54.4130	76.5625	51.9415	0.4858	1.5175	1.6069
CZ	70x70r	2×10^4	0.5	4.1602	54.1711	76.2412	51.7151	0.4851	1.5899	1.5908
KS	128x128	2×10^4	0.5	4.2149	54.3190	76.4420	51.8710	0.4859	1.6021	1.6022
UM	60x68r	5×10^4	0.5	5.5800	98.8000	137.3000	96.5000	0.4939	0.0000	0.0000
VT	64x64	5×10^4	0.5	5.6023	98.8462	137.3547	96.5175	0.4939	2.2957	2.2960
CU	64x64r	5×10^4	0.5	5.5900	98.8000	137.3000	96.5000	0.4940	2.2956	2.2983
CT	64x64	5×10^4	0.5	5.5697	98.8585	137.3575	96.5223	0.4937	2.1634	2.2963
CZ	70x70r	5×10^4	0.5	5.5167	98.3567	136.7003	96.0723	0.4926	2.2691	2.2710
KS	128x128	5×10^4	0.5	5.5888	98.5860	137.0200	96.2990	0.4938	2.2838	2.2843
UM	60x68r	10^5	0.5	6.8600	153.0000	211.0000	151.7000	0.5017	0.0000	0.0000
VT	64x64	10^5	0.5	6.8953	153.3941	210.9661	151.7382	0.5017	2.9408	2.9411
CU	64x64r	10^5	0.5	6.8800	153.1000	210.9000	151.7000	0.5017	2.9402	2.9443
CT	64x64	10^5	0.5	6.8554	153.0937	210.9541	151.7394	0.5015	2.7665	2.9413
CZ	70x70r	10^5	0.5	6.7867	152.2689	209.8677	151.0408	0.4997	2.9054	2.9088
KS	128x128	10^5	0.5	6.8744	152.5100	210.2800	151.2500	0.5015	2.9192	2.9203
UM	60x68r	2×10^5	0.5	8.3400	232.0000	319.8000	233.0000	0.5107	0.0000	0.0000
VT	64x64	2×10^5	0.5	8.3952	232.8304	319.6146	233.0634	0.5109	3.6915	3.6921
CU	64x64r	2×10^5	0.5	8.3600	232.2000	319.5000	233.0000	0.5108	3.6894	3.6971
CT	64x64	2×10^5	0.5	8.3473	232.1744	319.5560	233.0726	0.5106	3.4674	3.6919
CZ	70x70r	2×10^5	0.5	8.2603	230.9460	317.8150	232.1748	0.5080	3.6424	3.6486
KS	128x128	2×10^5	0.5	8.3619	231.0500	318.1500	232.2100	0.5107	3.6502	3.6524
UM	60x68r	5×10^5	0.5	9.3800	307.4000	448.7000	314.3000	0.5225	0.0000	0.0000
VT	64x64	5×10^5	0.5	9.4190	306.3868	449.6629	315.6399	0.5226	4.2337	4.2348
CU	64x64r	5×10^5	0.5	9.4200	309.6000	450.6000	316.3000	0.5224	4.2393	4.2577
CT	64x64	5×10^5	0.5	no convergence to steady state						
CZ	70x70r	5×10^5	0.5	no convergence to steady state						
KS	128x128	5×10^5	0.5	9.6938	323.7600	467.8200	331.6200	0.5213	4.3005	4.3057
UM	60x68r	10^6	0.5	no convergence to steady state						
VT	64x64	10^6	0.5	no convergence to steady state						
CU	64x64r	10^6	0.5	no convergence to steady state						
CT	64x64	10^6	0.5	no convergence to steady state						
CZ	70x70r	10^6	0.5	no convergence to steady state						
KS	128x128	10^6	0.5	no convergence to steady state						

Table 3. Steady-state extended Bousinesq results, $Di = 0.5$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1	2.1900	24.2000	34.2000	22.2000	0.4669	0.0000	0.0000
VT	64x64	10^4	1	2.1941	24.2321	34.2603	22.2428	0.4669	1.1877	1.1878
CU	64x64r	10^4	1	2.1900	24.2000	34.3000	22.2000	0.4671	1.1884	1.1894
CT	64x64	10^4	1	2.1760	24.2371	34.2652	22.2462	0.4668	1.1263	1.1882
CZ	70x70r	10^4	1	2.1534	23.9496	33.8713	21.9833	0.4658	1.1588	1.1592
KS	128x128	10^4	1	2.1932	24.2020	34.2190	22.2220	0.4669	1.1855	1.1856
UM	60x68r	2×10^4	1	2.6400	39.5000	55.4000	36.7000	0.4680	0.0000	0.0000
VT	64x64	2×10^4	1	2.6509	39.4931	55.3977	36.6826	0.4679	1.6397	1.6398
CU	64x64r	2×10^4	1	2.6500	39.5000	55.4000	36.7000	0.4682	1.6406	1.6421
CT	64x64	2×10^4	1	2.6267	39.5029	55.4067	36.6892	0.4678	1.5515	1.6405
CZ	70x70r	2×10^4	1	2.6016	39.0730	54.8275	36.2946	0.4664	1.6026	1.6033
KS	128x128	2×10^4	1	2.6489	39.4200	55.3000	36.6300	0.4680	1.6345	1.6346
UM	60x68r	5×10^4	1	3.3500	71.6000	99.5000	67.6000	0.4743	0.0000	0.0000
VT	64x64	5×10^4	1	3.3619	71.6272	99.5183	67.6470	0.4742	2.3439	2.3442
CU	64x64r	5×10^4	1	3.3600	71.6000	99.5000	67.6000	0.4744	2.3446	2.3469
CT	64x64	5×10^4	1	3.3295	71.6549	99.5427	67.6670	0.4740	2.2134	2.3458
CZ	70x70r	5×10^4	1	3.2972	70.8498	98.4471	66.9496	0.4719	2.2902	2.2918
KS	128x128	5×10^4	1	3.3567	71.3890	99.2300	67.4700	0.4747	2.3288	2.3292
UM	60x68r	10^5	1	3.9400	108.1000	150.2000	103.2000	0.4822	0.0000	0.0000
VT	64x64	10^5	1	3.9654	108.1412	150.1800	103.2033	0.4821	2.9424	2.9428
CU	64x64r	10^5	1	3.9600	108.2000	150.1000	103.2000	0.4823	2.9427	2.9469
CT	64x64	10^5	1	3.9279	108.1973	150.2237	103.2481	0.4819	2.7759	2.9450
CZ	70x70r	10^5	1	3.8924	107.1299	148.6977	102.3793	0.4789	2.8789	2.8820
KS	128x128	10^5	1	3.9571	107.6500	149.6100	102.8500	0.4820	2.9143	2.9152
UM	60x68r	2×10^5	1	4.4200	147.3000	209.4000	141.1000	0.4937	0.0000	0.0000
VT	64x64	2×10^5	1	4.4370	147.1003	208.9151	140.8588	0.4938	3.4174	3.4180
CU	64x64r	2×10^5	1	4.4300	147.4000	209.2000	141.1000	0.4937	3.4226	3.4305
CT	64x64	2×10^5	1	4.4020	147.2940	209.0816	141.0470	0.4934	3.2289	3.4215
CZ	70x70r	2×10^5	1	4.3979	147.9816	209.4869	142.2407	0.4893	3.3810	3.3873
KS	128x128	2×10^5	1	4.4409	146.9800	208.7800	141.0800	0.4934	3.3834	3.3854
UM	60x68r	5×10^5	1	no convergence to steady state						
VT	64x64	5×10^5	1	6.9258	204.3737	241.4118	0.0000	0.4994	5.9146	5.9167
CU	64x64r	5×10^5	1	5.8600	273.0000	379.5000	208.1000	0.5044	7.5270	7.5549
CT	64x64	5×10^5	1	no convergence to steady state						
CZ	70x70r	5×10^5	1	no convergence to steady state						
KS	128x128	5×10^5	1	no convergence to steady state						
UM	60x68r	10^6	1	no convergence to steady state						
VT	64x64	10^6	1	6.6662	213.8986	348.0533	0.0000	0.5064	7.0953	7.0988
CU	64x64r	10^6	1	6.6500	251.1000	318.4000	202.1000	0.4938	5.6958	5.7411
CT	64x64	10^6	1	no convergence to steady state						
CZ	70x70r	10^6	1	no convergence to steady state						
KS	128x128	10^6	1	no convergence to steady state						

Table 4. Steady-state extended Bousinessq results, $Di = 1$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	0.25	4.4160	40.0430	58.7100	39.2760	0.5130	0.8500	0.8500
VT	64x64	10^4	0.25	4.4300	40.2000	58.7400	39.3000	0.5127	0.8535	0.8510
CU	64x64r	10^4	0.25	4.4200	40.1000	58.7000	39.3000	0.5129	0.8539	0.8521
CT	64x64	10^4	0.25	4.4124	40.0745	58.7413	39.3013	0.5127	0.8068	0.851
CZ	70x70	10^4	0.25	4.37	40.22	58.99	39.45	0.512	0.8588	0.8621
KS	128x128	10^4	0.25	4.4237	40.0480	58.7110	39.2890	0.5128	0.85298	0.85048
UM	60x68r	2×10^4	0.25	5.5400	63.5220	92.5500	63.5640	0.5170	1.1300	1.1310
VT	64x64	2×10^4	0.25	5.5600	63.9000	92.6100	63.6000	0.5175	1.1360	1.1330
CU	64x64r	2×10^4	0.25	5.5500	63.6000	92.6000	63.6000	0.5177	1.1362	1.1341
CT	64x64	2×10^4	0.25	5.5399	63.5745	92.6088	63.6041	0.5175	1.0716	1.1327
CZ	70x70	2×10^4	0.25	5.4900	63.8600	93.0700	63.9100	0.5165	1.1448	1.1494
KS	128x128	2×10^4	0.25	5.5504	63.4970	92.5000	63.5500	0.5175	1.1335	1.1305
UM	60x68r	5×10^4	0.25	7.42	114.922	165.463	117.824	0.524	1.598	1.601
VT	64x64	5×10^4	0.25	7.4500	115.8300	165.4800	117.9000	0.5246	1.6080	1.6040
CU	64x64r	5×10^4	0.25	7.4400	115.0000	165.4000	117.8000	0.5247	1.6076	1.6056
CT	64x64	5×10^4	0.25	7.4291	114.9913	165.4749	117.8702	0.5245	1.5134	1.6039
CZ	70x70	5×10^4	0.25	7.3500	115.5400	166.3200	118.5400	0.5222	1.6238	1.6304
KS	128x128	5×10^4	0.25	7.4324	114.7500	165.1900	117.6600	0.5245	1.6014	1.5978
UM	60x68r	10^5	0.25	9.211	178.56	254.716	185.982	0.53	2.046	2.053
CU	64x64	10^5	0.25	9.2300	178.6000	254.6000	186.0000	0.5303	2.0597	2.0573
VT	64x64r	10^5	0.25	9.2600	180.2000	254.7000	186.0000	0.5303	2.0600	2.0550
CT	64x64	10^5	0.25	9.2330	178.6302	254.6538	186.0194	0.5301	1.9350	2.0551
CZ	70x70	10^5	0.25	9.1300	179.4000	255.7200	187.1000	0.5273	2.0815	2.0895
KS	128x128	10^5	0.25	9.2249	177.9900	253.8900	285.4300	0.5300	2.0458	2.0419
UM	60x68r	2×10^5	0.25	11.361	274.825	389.491	290.161	0.536	2.585	2.598
CU	64x64	2×10^5	0.25	11.3900	275.1000	389.5000	290.2000	0.5362	2.6053	2.6061
VT	64x64r	2×10^5	0.25	11.4600	278.0000	389.7000	290.4000	0.5362	2.6090	2.6040
CT	64x64	2×10^5	0.25	11.4218	275.1620	389.6517	290.4432	0.5360	2.4463	2.6039
CZ	70x70	2×10^5	0.25	11.2600	276.0400	390.4500	291.8800	0.5316	2.6352	2.6434
KS	128x128	2×10^5	0.25	11.3850	273.6500	387.6900	289.0500	0.5354	2.5792	2.5755
UM	60x68r	5×10^5	0.25	14.591	463.226	661.985	497.244	0.542	3.396	3.426
CU	64x64	5×10^5	0.25	14.6500	464.3000	662.7000	498.0000	0.5431	3.4350	3.4426
VT	64x64r	5×10^5	0.25	14.7800	469.8700	662.5600	497.8000	0.5430	3.4420	3.4370
CT	64x64	5×10^5	0.25	14.7311	464.2262	662.6993	498.1367	0.5427	3.2207	3.4375
CZ	70x70	5×10^5	0.25	14.6700	478.9500	676.4900	515.0000	0.5345	3.5354	3.5378
KS	128x128	5×10^5	0.25	14.7470	467.6500	664.3100	502.1300	0.5411	3.4041	3.4022
UM	60x68r	10^6	0.25	no convergence to steady state						
VT	64x64	10^6	0.25	no convergence to steady state						
CU	64x64r	10^6	0.25	no convergence to steady state						
CT	64x64	10^6	0.25	no convergence to steady state						
CZ	70x70	10^6	0.25	no convergence to steady state						
KS	128x128	10^6	0.25	16.488	599.89	886.36	656.78	0.53881	3.8285	3.832

Table 5. Steady-state TALA results, $Di = 0.25$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	0.5	3.851	36.307	54.275	36.082	0.519	1.404	1.391
VT	64x64	10^4	0.5	3.8600	36.4000	54.3000	36.1000	0.5188	1.4100	1.3930
CU	64x64r	10^4	0.5	3.8600	36.3000	54.3000	36.1000	0.5191	1.4103	1.3948
CT	64x64	10^4	0.5	3.8400	36.3371	54.3184	36.1051	0.5187	1.3327	1.3933
CZ	70x70	10^4	0.5	3.8000	36.3500	54.3400	36.1000	0.5171	1.4083	1.4100
KS	128x128	10^4	0.5	3.8631	36.3230	54.3030	36.1080	0.5189	1.4097	1.3932
UM	60x68r	2×10^4	0.5	4.755	57.299	85.427	58.063	0.526	1.851	1.836
VT	64x64	2×10^4	0.5	4.7700	57.6000	85.5000	58.1000	0.5261	1.8600	1.8400
CU	64x64r	2×10^4	0.5	4.7700	57.4000	85.5000	58.1000	0.5263	1.8609	1.8421
CT	64x64	2×10^4	0.5	4.7440	57.3478	85.4802	58.0982	0.5260	1.7556	1.8402
CZ	70x70	2×10^4	0.5	4.6900	57.4100	85.6000	58.1600	0.5236	1.8620	1.8650
KS	128x128	2×10^4	0.5	4.7701	57.2770	85.4020	58.0590	0.5262	1.8569	1.8367
UM	60x68r	5×10^4	0.5	6.238	102.617	152.25	106.519	0.536	2.586	2.57
VT	64x64	5×10^4	0.5	6.2700	103.4000	152.3000	106.6000	0.5368	2.6020	2.5760
CU	64x64r	5×10^4	0.5	6.2600	102.7000	152.3000	106.5000	0.5369	2.6013	2.5790
CT	64x64	5×10^4	0.5	6.2312	102.6912	152.3057	106.5677	0.5366	2.4496	2.5765
CZ	70x70	5×10^4	0.5	6.1600	102.9200	152.6000	106.8800	0.5326	2.6109	2.6162
KS	128x128	5×10^4	0.5	6.2560	102.4000	151.9600	106.3400	0.5366	2.5879	2.5631
UM	60x68r	10^5	0.5	7.588	156.503	232.079	165.097	0.545	3.258	3.245
VT	64x64	10^5	0.5	7.6300	157.9300	231.9000	165.1000	0.5454	3.2790	3.2500
CU	64x64r	10^5	0.5	7.6100	156.5000	231.9000	165.0000	0.5455	3.2779	3.2552
CT	64x64	10^5	0.5	7.5868	156.5378	231.9270	165.1083	0.5452	3.0825	3.2509
CZ	70x70	10^5	0.5	7.5000	157.7400	233.2700	166.6500	0.5386	3.3108	3.3169
KS	128x128	10^5	0.5	7.6105	155.9000	231.1900	164.6100	0.5449	3.2511	3.2238
UM	60x68r	2×10^5	0.5	8.913	223.601	336.567	239.862	0.553	3.921	3.922
VT	64x64	2×10^5	0.5	8.9800	226.0300	336.1000	239.6000	0.5540	3.9530	3.9260
CU	64x64r	2×10^5	0.5	8.9400	223.6000	336.2000	239.7000	0.5540	3.9519	3.9353
CT	64x64	2×10^5	0.5	8.9286	223.6042	336.2790	239.8384	0.5536	3.7156	3.9279
CZ	70x70	2×10^5	0.5	8.9300	231.1600	344.6900	248.4000	0.5446	4.0600	4.0633
KS	128x128	2×10^5	0.5	8.9981	224.8600	337.6500	241.5100	0.5529	3.9279	3.9027
UM	60x68r	5×10^5	0.5	9.252	249.871	401.392	276.315	0.561	4.093	4.143
VT	64x64	5×10^5	0.5	no convergence to steady state						
CU	64x64r	5×10^5	0.5	no convergence to steady state						
CT	64x64	5×10^5	0.5	no convergence to steady state						
CZ	70x70	5×10^5	0.5	no convergence to steady state						
KS	128x128	5×10^5	0.5	9.4328	255.92	411.44	284.43	0.55981	4.1475	4.142
UM	60x68r	10^6	0.5	10.275	312.092	510.491	343.34	0.573	4.593	4.687
KS	128x128	10^6	0.5	no convergence to steady state						

Table 6. Steady-state TALA results, $Di = 0.5$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1	2.556	26.007	40.595	26.416	0.509	1.459	1.396
VT	64x64	10^4	1	2.5700	26.1000	40.6000	26.4000	0.5088	1.4650	1.4000
CU	64x64r	10^4	1	2.5700	26.0000	40.6000	26.4000	0.5092	1.4651	1.4019
CT	64x64	10^4	1	2.5419	26.0368	40.6299	26.4400	0.5088	1.3874	1.4014
CZ	70x70	10^4	1	2.5100	25.9900	40.4800	26.3500	0.5051	1.4550	1.4245
KS	128x128	10^4	1	2.5681	26.0110	40.6140	26.4360	0.5091	1.4640	1.3999
UM	60x68r	2×10^4	1	3.004	40.293	63.214	41.594	0.515	1.888	1.813
VT	64x64	2×10^4	1	3.0200	40.5000	63.2000	46.6000	0.5146	1.8970	1.8200
CU	64x64r	2×10^4	1	3.0200	40.3000	63.2000	41.6000	0.5148	1.8982	1.8234
CT	64x64	2×10^4	1	2.9871	40.3493	63.2631	41.3691	0.5145	1.7943	1.8217
CZ	70x70	2×10^4	1	2.9600	40.4900	63.3300	41.7500	0.5098	1.8985	1.8626
KS	128x128	2×10^4	1	3.0171	40.2340	63.1570	41.5710	0.5148	1.8895	1.8133
UM	60x68r	5×10^4	1	3.621	67.071	106.988	70.69	0.523	2.493	2.414
VT	64x64	5×10^4	1	3.6400	67.7000	107.0000	70.7000	0.5234	2.5090	2.4260
CU	64x64r	5×10^4	1	3.6400	67.2000	107.0000	70.7000	0.5235	2.5117	2.4326
CT	64x64	5×10^4	1	3.6050	67.1859	107.0605	70.7875	0.5232	2.3725	2.4302
CZ	70x70	5×10^4	1	3.6100	68.7400	108.8900	72.5200	0.5163	2.5594	2.5216
KS	128x128	5×10^4	1	3.6369	66.8050	106.6700	70.5430	0.5235	2.4846	2.4030
UM	60x68r	10^5	1	3.907	85.105	141.607	91.345	0.529	2.802	2.75
VT	64x64	10^5	1	3.9200	86.0800	141.3000	91.1000	0.5297	2.8210	2.7570
CU	64x64r	10^5	1	3.9200	85.1000	141.4000	91.3000	0.5297	2.8278	2.7725
CT	64x64	10^5	1	3.8939	85.1496	141.5171	91.3767	0.5294	2.6753	2.7645
CZ	70x70	10^5	1	3.9800	91.0600	149.1100	98.1400	0.5208	2.9744	2.9547
KS	128x128	10^5	1	3.9326	84.9430	141.4700	91.5030	0.5296	2.7912	2.7295
UM†	60x68r	2×10^5	1	4.959	105.571	140.526	8.59	0.522	3.849	3.837
VT	64x64	2×10^5	1	no convergence to steady state						
CU	64x64r	2×10^5	1	4.1000	99.2000	175.0000	107.3000	0.5344	3.0460	3.0193
CT	64x64	2×10^5	1	4.0842	99.3175	175.2978	107.5874	0.534	2.8927	3.0045
CZ	70x70	2×10^5	1	no convergence to steady state						
KS	128x128	2×10^5	1	4.1232	98.961	175.29	108.02	0.53432	2.9959	2.957
UM†	60x68r	5×10^5	1	6.174	157.989	230.856	0.126	0.523	5.083	5.165
VT	64x64	5×10^5	1	no convergence to steady state						
CU	64x64r	5×10^5	1	no convergence to steady state						
CT†	64x64	5×10^5	1	6.1744	159.1369	232.122	0	0.5236	4.8806	5.1223
CZ	70x70	5×10^5	1	no convergence to steady state						
KS	128x128	5×10^5	1	no convergence to steady state						

†two cell or mixed-mode solution

Table 7. Steady-state TALA results, $Di = 1$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1.25	1.902	19.072	30.817	19.585	0.494	1.021	0.956
VT	64x64	10^4	1.25	1.9092	19.1449	30.8372	19.5994	0.4942	1.0248	0.9613
CU	64x64r	10^4	1.25	1.9100	19.1000	30.8000	19.6000	0.4946	1.0251	0.9624
CT	64x64	10^4	1.25	1.8912	19.1045	30.8541	19.6115	0.4942	0.97	0.96274
CZ	70x70	10^4	1.25	1.8859	19.126	30.8052	19.6146	0.4918	1.0212	0.9784
KS	128x128	10^4	1.25	1.9091	19.0560	30.8130	19.5830	0.4945	1.02	0.95931
UM	60x68r	2×10^4	1.25	2.151	29	47.338	30.065	0.497	1.315	1.24
VT	64x64	2×10^4	1.25	2.1604	29.1821	47.3627	30.0949	0.4969	1.3215	1.2476
CU	64x64r	2×10^4	1.25	2.1600	29.0000	47.4000	30.1000	0.4972	1.3220	1.2497
CT	64x64	2×10^4	1.25	2.1390	29.0685	47.4022	30.1249	0.4968	1.2537	1.2497
CZ	70x70	2×10^4	1.25	2.1422	29.3531	47.699	30.4204	0.4939	1.3306	1.28
KS	128x128	2×10^4	1.25	2.1579	28.9010	47.2310	29.9980	0.4972	1.3118	1.2389
UM	60x68r	5×10^4	1.25	2.444	45.127	76.279	47.331	0.501	1.682	1.611
VT	64x64	5×10^4	1.25	2.4559	45.6250	76.3289	47.3811	0.5012	1.6959	1.6251
CU	64x64r	5×10^4	1.25	2.4600	45.2000	76.3000	47.4000	0.5014	1.6978	1.6307
CT	64x64	5×10^4	1.25	2.4341	45.2941	76.4667	47.4936	0.5010	1.6113	1.6302
CZ†	70x70	5×10^4	1.25	2.4206	34.4727	41.2956	0	0.4867	1.7064	1.6452
KS	128x128	5×10^4	1.25	2.4507	44.7950	75.9280	47.1030	0.5014	1.6691	1.6004
UM†	60x68r	10^5	1.25	2.944	53.887	68.697	1.43	0.491	2.3	2.259
VT	64x64	10^5	1.25	2.5955	56.9971	100.1792	58.7830	0.5038	1.8977	1.8436
CU†	64x64r	10^5	1.25	2.9600	54.0000	67.6000	42.6000	0.4918	2.3326	2.2748
CT	64x64	10^5	1.25	2.5779	56.3319	100.4788	59.0548	0.5035	1.8108	1.8532
CZ†	70x70	10^5	1.25	2.9101	54.0581	67.6126	0	0.4886	2.3131	2.2387
KS	128x128	10^5	1.25	2.5937	55.6310	99.7770	58.5900	0.5040	1.8600	1.8086
UM†	60x68r	2×10^5	1.25	3.505	79.61	107.771	1.123	0.493	2.993	2.972
VT†	64x64	2×10^5	1.25	3.5336	81.0501	107.1631	0.0000	0.4935	3.0365	2.9679
CU†	64x64r	2×10^5	1.25	3.5300	79.7000	107.1000	67.3000	0.4935	3.0431	2.9907
CT†	64x64	2×10^5	1.25	3.4922	79.0000	107.3079	0.0000	0.4932	2.8844	2.98
CZ†	70x70	2×10^5	1.25	3.4692	81.1915	107.8932	0	0.4885	3.0605	2.9935
KS†	128x128	2×10^5	1.25	3.5289	78.1750	1006.5400	0.0000	0.4936	2.9354	2.8734
UM†	60x68r	5×10^5	1.25	4.274	118.761	183.282	0.546	0.493	3.972	4.03
VT†	64x64	5×10^5	1.25	4.3109	121.7197	182.9307	0.0000	0.4942	4.0440	3.9919
CU†	64x64r	5×10^5	1.25	4.3000	118.6000	183.0000	113.2000	0.4940	4.0642	4.0538
CT†	64x64	5×10^5	1.25	4.2658	118.8382	183.3963	0.0000	0.4935	3.8403	4.0157
CZ†	70x70	5×10^5	1.25	4.2639	122.0449	186.8631	0	0.4885	4.1332	4.1361
KS†	128x128	5×10^5	1.25	4.3104	115.9900	181.8000	0.0000	0.4942	3.8544	3.8146
UM	60x68r	10^6	1.25	no convergence to steady state						
VT	64x64	10^6	1.25	no convergence to steady state						
CU	64x64r	10^6	1.25	no convergence to steady state						
CT	64x64	10^6	1.25	no convergence to steady state						
CZ	70x70	10^6	1.25	no convergence to steady state						
KS	128x128	10^6	1.25	no convergence to steady state						

†two cell or mixed-mode solution

Table 8. Steady-state TALA results, $Di = 1.25$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1.5	1.359	11.027	19.557	11.704	0.478	0.477	0.445
VT	64x64	10^4	1.5	1.3619	11.0726	19.5571	11.7097	0.4781	0.4795	0.4484
CU	64x64r	10^4	1.5	1.3600	11.0000	19.6000	11.7000	0.4784	0.4797	0.4493
CT	64x64	10^4	1.5	1.3532	11.0511	19.5727	11.7207	0.4780	0.4572	0.4492
CZ	70x70	10^4	1.5	1.3493	11.1559	19.6363	11.8283	0.476	0.4797	0.4544
KS	128x128	10^4	1.5	1.3621	11.0040	19.5390	11.6890	0.4783	0.4780	0.4472
UM	60x68r	2×10^4	1.5	1.467	16.486	29.644	17.2	0.476	0.63	0.591
VT	64x64	2×10^4	1.5	1.4714	16.6066	29.6534	17.2130	0.4761	0.6336	0.5977
CU	64x64r	2×10^4	1.5	1.4700	16.5000	29.7000	17.2000	0.4764	0.6343	0.5995
CT	64x64	2×10^4	1.5	1.4612	16.5373	29.6900	17.2407	0.4761	0.6043	0.5991
CZ	70x70	2×10^4	1.5	1.4629	16.9203	30.1098	17.6791	0.4737	0.644	0.6129
KS	128x128	2×10^4	1.5	1.4703	16.3860	29.5350	17.1120	0.4764	0.6274	0.5922
UM†	60x68r	5×10^4	1.5	1.758	24.169	31.793	0.144	0.462	1.049	1.017
VT	64x64	5×10^4	1.5	1.6118	25.8851	48.1001	25.7446	0.4745	0.8441	0.8085
CU†	64x64r	5×10^4	1.5	1.7700	24.2000	31.7000	20.0000	0.4623	1.0609	1.0222
CT	64x64	5×10^4	1.5	1.6010	25.6743	48.2145	25.8443	0.4744	0.8069	0.8120
CZ†	70x70	5×10^4	1.5	1.7312	24.1692	31.4598	-0.0005	0.4597	1.0462	0.9943
KS	128x128	5×10^4	1.5	1.6071	25.1850	47.6300	25.3250	0.4749	0.8241	0.7899
UM†	60x68r	10^5	1.5	2.041	37.519	51.588	0.357	0.461	1.455	1.422
VT†	64x64	10^5	1.5	2.0524	38.1449	51.3533	0.0000	0.4612	1.4729	1.4229
CU	64x64r	10^5	1.5	2.0500	37.6000	51.4000	32.1000	0.4614	1.4763	1.4320
CT†	64x64	10^5	1.5	2.0294	37.6657	51.4167	0.0000	0.4611	1.4057	1.4289
CZ†	70x70	10^5	1.5	2.0156	37.8632	51.238	0.0008	0.4587	1.469	1.4087
KS†	128x128	10^5	1.5	2.0530	36.9510	51.2150	0.0000	0.4615	1.4333	1.3863
UM†	60x68r	2×10^5	1.5	2.369	55.204	80.834	0.121	0.46	1.957	1.94
VT†	64x64	2×10^5	1.5	2.3850	56.4498	80.8895	0.0000	0.4608	1.9701	1.9183
CU†	64x64r	2×10^5	1.5	2.3800	55.4000	80.9000	50.1000	0.4609	1.9766	1.9366
CT†	64x64	2×10^5	1.5	2.3573	55.4823	81.0616	0.0000	0.4605	1.8792	1.9301
CZ†	70x70	2×10^5	1.5	2.3492	56.2773	81.2775	-0.0004	0.4579	1.9822	1.9321
KS†	128x128	2×10^5	1.5	2.3808	53.8680	80.2730	0.0000	0.4611	1.8820	1.8356
UM†	60x68r	5×10^5	1.5	2.833	84.435	138.079	0.016	0.46	2.673	2.711
VT†	64x64	5×10^5	1.5	2.8546	87.1560	138.6849	0.0000	0.4602	2.6920	2.6494
CU†	64x64r	5×10^5	1.5	2.8500	84.8000	138.8000	83.6000	0.4601	2.7148	2.7002
CT†	64x64	5×10^5	1.5	2.8249	85.0069	139.2285	0.0000	0.4597	2.5682	2.6741
CZ†	70x70	5×10^5	1.5	2.8287	86.7323	140.8995	-0.0013	0.4571	2.7467	2.7274
KS†	128x128	5×10^5	1.5	2.8454	81.7640	136.9300	0.0000	0.4606	2.5138	2.4798
UM	60x68r	10^6	1.5	no convergence to steady state						
VT	64x64	10^6	1.5	no convergence to steady state						
CU	64x64r	10^6	1.5	no convergence to steady state						
CT	64x64	10^6	1.5	no convergence to steady state						
CZ	70x70	10^6	1.5	no convergence to steady state						
KS	128x128	10^6	1.5	no convergence to steady state						

†two cell or mixed-mode solution

Table 9. Steady-state TALA results, $Di = 1.5$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1.75	no result reported						
VT	64x64	10^4	1.75	1.1362	6.1690	13.3932	7.6099	0.4766	0.2130	0.2035
CU	64x64r	10^4	1.75	no result reported						
CT	64x64	10^4	1.75	1.1312	6.1580	13.3999	7.6143	0.4765	0.2037	0.2036
CZ	70x70	10^4	1.75	1.1232	6.0947	13.2347	7.5716	0.4752	0.2046	0.1984
KS	128x128	10^4	1.75	1.1375	6.1578	13.4180	7.6213	0.4766	0.2140	0.2044
UM	60x68r	2×10^4	1.75	no result reported						
VT	64x64	2×10^4	1.75	1.1983	9.8336	21.2109	11.5084	0.4694	0.3114	0.2980
CU	64x64r	2×10^4	1.75	no result reported						
CT	64x64	2×10^4	1.75	1.1915	9.7936	21.2217	11.5164	0.4693	0.2976	0.2981
CZ	70x70	2×10^4	1.75	1.1824	9.7574	21.0607	11.522	0.4672	0.302	0.2925
KS	128x128	2×10^4	1.75	1.1997	9.7630	21.2090	11.4970	0.4697	0.3112	0.2977
UM†	60x68r	5×10^4	1.75	1.347	15.811	24.906	0.033	0.448	0.553	0.536
VT†	64x64	5×10^4	1.75	1.2728	16.1937	35.5295	17.4209	0.4619	0.4347	0.4188
CU	64x64r	5×10^4	1.75	no result reported						
CT	64x64	5×10^4	1.75	1.2643	16.0615	35.5600	17.4548	0.4617	0.4155	0.4192
CZ	70x70	5×10^4	1.75	1.2664	16.1436	35.6693	17.8717	0.4609	0.4291	0.42
KS	128x128	5×10^4	1.75	1.2733	15.8620	35.3210	17.1260	0.4626	0.4287	0.4128
UM†	60x68r	10^5	1.75	1.463	24.121	38.904	0.086	0.439	0.747	0.731
VT†	64x64	10^5	1.75	1.4704	24.5146	38.8889	0.0000	0.4387	0.7566	0.7313
CU	64x64r	10^5	1.75	no result reported						
CT†	64x64	10^5	1.75	1.4535	24.1918	38.8996	0.0000	0.4385	0.7235	0.7327
CZ†	70x70	10^5	1.75	1.4566	23.9201	38.6876	0	0.4393	0.7356	0.7164
KS†	128x128	10^5	1.75	1.4751	23.8920	38.8970	0.0000	0.4393	0.7435	0.7187
UM†	60x68r	2×10^5	1.75	1.609	35.391	59.645	0.217	0.433	0.996	0.986
VT†	64x64	2×10^5	1.75	1.6172	36.1790	59.5014	0.0000	0.4326	1.0122	0.9860
CU†	64x64r	2×10^5	1.75	no result reported						
CT†	64x64	2×10^5	1.75	1.5978	35.5073	59.5607	0.0000	0.4323	0.9690	0.9904
CZ†	70x70	2×10^5	1.75	1.6636	34.9413	60.3582	-0.0009	0.4407	0.9795	0.9752
KS†	128x128	2×10^5	1.75	1.6205	34.6490	59.2260	0.0000	0.4334	0.9722	0.9474
UM†	60x68r	5×10^5	1.75	no result reported						
VT†	64x64	5×10^5	1.75	1.8574	57.9307	101.6750	0.0000	0.4278	1.4389	1.4156
CU	64x64r	5×10^5	1.75	no result reported						
CT†	64x64	5×10^5	1.75	1.8360	56.4381	101.9663	0.0000	0.4275	1.3786	1.4281
CZ†	70x70	5×10^5	1.75	1.8481	56.0726	101.9857	-0.0004	0.4283	1.4146	1.4035
KS†	128x128	5×10^5	1.75	1.8518	53.8510	99.8800	0.0000	0.4287	1.3249	1.3042
UM†	60x68r	10^6	1.75	1.847	56.326	101.937	0.512	0.428	1.414	1.428
VT†	64x64	10^6	1.75	2.0577	80.1415	148.1155	0.0012	0.4256	1.7999	1.7830
CU†	64x64r	10^6	1.75	no result reported						
CT†	64x64	10^6	1.75	2.0378	77.6205	148.8825	0.0000	0.4252	1.7243	1.8050
CZ†	70x70	10^6	1.75	2.0469	78.159	149.9892	-0.0003	0.4248	1.823	1.7699
KS†	128x128	10^6	1.75	2.0358	72.3650	143.4600	0.0000	0.4266	1.5881	1.5737

†two cell or mixed-mode solution

Table 10. Steady-state TALA results, $Di = 1.75$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	2	no result reported						
VT	64x64	10^4	2	no result reported						
CU	64x64r	10^4	2	no result reported						
CT	64x64	10^4	2	1.0292	2.7344	7.2806	4.0132	0.4923	0.0539	0.0551
CZ	70x70	10^4	2	1.0406	2.279	6.1926	3.6551	0.4979	0.0368	0.0363
KS	128x128	10^4	2	no convection						
UM	60x68r	2×10^4	2	no result reported						
VT	64x64	2×10^4	2	1.0991	6.4514	16.2366	8.3594	0.4795	0.1775	0.1706
CU	64x64r	2×10^4	2	1.1100	6.4000	16.3000	8.4000	0.4815	0.1797	0.1729
CT	64x64	2×10^4	2	1.0944	6.4282	16.2508	8.3700	0.4794	0.1688	0.1706
CZ	70x70	2×10^4	2	1.1824	6.7574	17.0607	8.522	0.4672	0.1802	0.1725
KS	128x128	2×10^4	2	1.1002	6.4164	16.2520	8.3533	0.4797	0.17798	0.17078
UM	60x68r	5×10^4	2	no result reported						
VT	64x64	5×10^4	2	1.1507	11.3168	28.6461	12.8102	0.4705	0.2707	0.2607
CU†	64x64r	5×10^4	2	1.2000	11.4000	21.3000	13.4000	0.4590	0.3575	0.3437
CT	64x64	5×10^4	2	1.1444	11.2777	28.7535	13.0091	0.4703	0.2574	0.2613
CZ	70x70	5×10^4	2	1.1373	11.4283	28.9344	13.8327	0.4681	0.2673	0.2624
KS†	128x128	5×10^4	2	1.2023	11.3680	21.2410	0.0000	0.4584	0.35524	0.34038
UM	60x68r	10^5	2	no result reported						
VT†	64x64	10^5	2	1.1627	20.4347	33.2509	0.0000	0.3776	0.4990	0.4820
CU†	64x64r	10^5	2	1.2700	17.7000	33.0000	20.5000	0.4485	0.4769	0.4608
CT†	64x64	10^5	2	1.2493	17.6427	32.9342	0.0000	0.4476	0.4487	0.4572
CZ†	70x70	10^5	2	1.2199	17.2716	32.1432	0	0.4442	0.4477	0.4359
KS†	128x128	10^5	2	1.2669	17.4900	32.9260	0.0000	0.4483	0.47019	0.45255
UM	60x68r	2×10^5	2	no result reported						
VT†	64x64	2×10^5	2	1.3267	26.1985	49.2101	0.0000	0.4385	0.5996	0.5827
CU†	64x64r	2×10^5	2	1.3300	25.8000	49.2000	30.0000	0.4386	0.6008	0.5852
CT†	64x64	2×10^5	2	1.3101	25.7536	49.2140	0.0000	0.4381	0.5668	0.5812
CZ†	70x70	2×10^5	2	1.2752	25.3047	48.1456	0	0.4338	0.5674	0.5613
KS†	128x128	2×10^5	2	1.3308	25.3150	49.0430	0.0000	0.4391	0.58493	0.56694
UM	60x68r	5×10^5	2	no result reported						
VT†	64x64	5×10^5	2	1.4140	40.9532	80.7812	0.0000	0.4266	0.7813	0.7687
CU†	64x64r	5×10^5	2	1.4100	39.9000	80.8000	47.1000	0.4265	0.7834	0.7730
CT†	64x64	5×10^5	2	1.3942	39.9070	80.8116	0.0000	0.4259	0.739	0.7663
CZ†	70x70	5×10^5	2	1.3278	39.4978	76.8726	-0.0002	0.4041	0.7053	0.6515
KS†	128x128	5×10^5	2	1.4176	38.5770	79.7390	0.0000	0.4278	0.73765	0.72258
UM	60x68r	10^6	2	no result reported						
VT†	64x64	10^6	2	1.4799	55.4043	114.4546	0.0000	0.4184	0.9218	0.9163
CU†	64x64r	10^6	2	1.4700	53.6000	114.4000	63.2000	0.4178	0.9270	0.9245
CT†	64x64	10^6	2	1.4584	53.614	114.6176	0	0.4174	0.8721	0.9121
CZ†	70x70	10^6	2	1.4097	55.4777	116.2296	0	0.3967	0.8994	0.7765
KS†	128x128	10^6	2	1.4815	50.97	111.91	0	0.42013	0.84208	0.8309

†two cell or mixed-mode solution

Table 11. Steady-state TALA results $Di = 2.0$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	0.25	4.406	39.952	58.048	38.808	0.515	0.847	0.849
VT	64x64	10^4	0.25	4.4144	40.0951	58.0846	38.8370	0.5146	0.8490	0.8490
CU	64x64r	10^4	0.25	4.4100	40.0000	58.1000	38.8000	0.5148	0.8494	0.8501
UM	60x68r	2×10^4	0.25	5.529	63.387	91.627	62.881	0.52	1.127	1.129
VT	64x64	2×10^4	0.25	5.5436	63.7224	91.6792	62.9232	0.5193	1.1304	1.1304
CU	64x64r	2×10^4	0.25	5.5400	63.4000	91.7000	62.9000	0.5195	1.1307	1.1318
UM	60x68r	5×10^4	0.25	7.407	114.694	163.973	116.7	0.526	1.594	1.6
VT	64x64	5×10^4	0.25	7.4355	115.5236	163.9887	116.7456	0.5262	1.6011	1.6012
CU	64x64r	5×10^4	0.25	7.4200	114.7000	163.9000	116.7000	0.5263	1.6007	1.6028
UM	60x68r	10^5	0.25	9.196	178.229	252.54	184.336	0.532	2.041	2.051
VT	64x64	10^5	0.25	9.2428	179.7523	252.4588	184.3711	0.5318	2.0518	2.0519
CU	64x64r	10^5	0.25	9.2100	178.2000	252.4000	184.3000	0.5319	2.0503	2.0540
UM	60x68r	2×10^5	0.25	11.344	274.378	386.259	287.772	0.537	2.579	2.596
VT	64x64	2×10^5	0.25	11.4402	277.3524	386.4043	288.0402	0.5377	2.6004	2.6005
CU	64x64r	2×10^5	0.25	11.3700	274.3000	386.1000	287.7000	0.5380	2.5952	2.6014
UM	60x68r	5×10^5	0.25	14.577	462.878	657.024	493.879	0.544	3.391	3.425
VT	64x64	5×10^5	0.25	14.7653	469.3189	657.5943	494.4812	0.5444	3.4339	3.4343
CU	64x64r	5×10^5	0.25	14.6300	463.7000	657.7000	494.6000	0.5444	3.4267	3.4397
UM	60x68r	10^6	0.25	14.772	495.573	753.942	542.921	0.538	3.436	3.495
VT	64x64	10^6	0.25	no convergence to steady state						
CU	64x64r	10^6	0.25	no convergence to steady state						
UM	60x68r	10^4	0.5	3.812	35.936	52.694	34.969	0.522	1.381	1.381
VT	64x64	10^4	0.5	3.8218	36.0425	52.8172	35.0583	0.5214	1.3812	1.3812
CU	64x64r	10^4	0.5	3.8200	35.9000	52.8000	35.1000	0.5217	1.3818	1.3830
UM	60x68r	2×10^4	0.5	4.71	56.752	83.187	56.443	0.529	1.824	1.825
VT	64x64	2×10^4	0.5	4.7284	57.0197	83.3502	56.5644	0.5285	1.8266	1.8266
CU	64x64r	2×10^4	0.5	4.7200	56.7000	83.3000	56.6000	0.5286	1.8272	1.8291
UM	60x68r	5×10^4	0.5	6.185	101.722	148.711	103.892	0.539	2.552	2.558
VT	64x64	5×10^4	0.5	6.2134	102.4165	148.8866	104.0604	0.5388	2.5607	2.5608
CU	64x64r	5×10^4	0.5	6.2000	101.7000	148.8000	104.0000	0.5389	2.5604	2.5637
UM	60x68r	10^5	0.5	7.532	155.304	227.068	161.439	0.548	3.221	3.233
VT	64x64	10^5	0.5	7.5719	156.5589	227.1246	161.6041	0.5472	3.2344	3.2346
CU	64x64r	10^5	0.5	7.5500	155.1000	227.1000	161.5000	0.5472	3.2330	3.2392
UM	60x68r	2×10^5	0.5	8.871	222.771	330.776	235.953	0.555	3.893	3.917
VT	64x64	2×10^5	0.5	8.9294	225.0393	330.6127	235.9581	0.5554	3.9170	3.9173
CU	64x64r	2×10^5	0.5	8.9000	222.6000	330.7000	236.0000	0.5555	3.9151	3.9266
UM	60x68r	5×10^5	0.5	9.237	249.626	398.695	274.946	0.562	4.079	4.143
VT	64x64	5×10^5	0.5	no convergence to steady state						
CU	64x64r	5×10^5	0.5	no convergence to steady state						
UM	60x68r	10^6	0.5	10.26	311.304	507.696	341.937	0.574	4.576	4.686
VT	64x64	10^6	0.5	no convergence to steady state						
CU	64x64r	10^6	0.5	no convergence to steady state						

Table 12. Steady-state ALA results $Di = 0 - 0.5$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	0.75	3.138	30.832	45.564	-29.939	0.521	1.541	1.541
VT	64x64	10^4	0.75	3.1564	30.9950	45.9445	30.2160	0.5197	1.5444	1.5444
CU	64x64r	10^4	0.75	no result reported						
UM	60x68r	2×10^4	0.75	3.8	48.41	71.916	-48.078	0.528	2.022	2.024
VT	64x64	2×10^4	0.75	3.8234	48.7428	72.4248	48.4599	0.5267	2.0290	2.0290
CU	64x64r	2×10^4	0.75	no result reported						
UM	60x68r	5×10^4	0.75	4.84	85.036	127.32	-86.848	0.538	2.784	2.791
VT	64x64	5×10^4	0.75	4.8731	85.7933	127.9885	87.3850	0.5372	2.7983	2.7984
CU	64x64r	5×10^4	0.75	no result reported						
UM	60x68r	10^5	0.75	5.644	122.469	186.629	-127.755	0.546	3.387	3.401
VT	64x64	10^5	0.75	5.6787	123.6666	187.0503	128.1764	0.5458	3.4035	3.4038
CU	64x64r	10^5	0.75	no result reported						
UM	60x68r	2×10^5	0.75	5.934	141.566	230.08	-153.011	0.551	3.63	3.665
VT	64x64	2×10^5	0.75	5.9556	143.6047	229.3043	152.5447	0.5516	3.6535	3.6542
CU	64x64r	2×10^5	0.75	no result reported						
UM	60x68r	5×10^5	0.75	6.569	178.912	308.928	-197.085	0.561	4.1	4.182
VT	64x64	5×10^5	0.75	no convergence to steady state						
CU	64x64r	5×10^5	0.75	no result reported						
UM	60x68r	10^6	0.75	7.318	226.266	408.774	-253.058	0.566	4.651	4.788
VT†	64x64	10^6	0.75	10.0108	268.4870	403.0670	0.0000	0.5466	6.7282	6.7316
CU	64x64r	10^6	0.75	no result						
UM	60x68r	10^4	1	2.438	24.663	36.767	-23.811	0.512	1.343	1.349
VT	64x64	10^4	1	2.4716	25.0157	37.6020	24.4009	0.5100	1.3622	1.3621
CU	64x64r	10^4	1	2.4700	24.9000	37.6000	24.4000	0.5103	1.3627	1.3638
UM	60x68r	2×10^4	1	2.878	38.453	57.992	-37.973	0.517	1.761	1.771
VT	64x64	2×10^4	1	2.9155	39.0295	59.1039	38.7772	0.5153	1.7840	1.7840
CU	64x64r	2×10^4	1	2.9100	38.8000	59.1000	38.8000	0.5155	1.7845	1.7864
UM	60x68r	5×10^4	1	3.51	64.925	100.244	-66.063	0.524	2.375	2.391
VT	64x64	5×10^4	1	3.5481	65.8980	101.5172	67.0285	0.5234	2.4029	2.4030
CU	64x64r	5×10^4	1	3.5400	65.4000	101.5000	67.0000	0.5236	2.4031	2.4074
UM	60x68r	10^5	1	3.857	84.587	136.877	-88.567	0.53	2.742	2.765
VT	64x64	10^5	1	3.8780	85.5803	137.1660	88.7874	0.5294	2.7610	2.7614
CU	64x64r	10^5	1	3.8800	84.6000	137.2000	88.8000	0.5294	2.7652	2.7742
UM†	60x68r	2×10^5	1	4.84	103.194	147.369	-25.531	0.523	3.714	3.785
VT	64x64	2×10^5	1	4.0780	100.9249	171.5152	105.6082	0.5340	2.9982	2.9992
CU	64x64r	2×10^5	1	4.0700	99.0000	171.6000	105.7000	0.5339	3.0054	3.0235
UM†	60x68r	5×10^5	1	6.103	156.946	225.07	0.161	0.523	4.993	5.14
VT†	64x64	5×10^5	1	6.1681	161.7634	226.4310	0.0000	0.5245	5.0752	5.0777
CU†	64x64r	5×10^5	1	6.1400	157.9000	226.3000	143.6000	0.5242	5.0842	5.1340
UM†	60x68r	10^6	1	6.994	202.086	320.782	-0.083	0.524	5.902	6.144
VT	64x64	10^6	1	no convergence to steady state						
CU	64x64r	10^6	1	no convergence to steady state						

†two cell or mixed-mode solution

Table 13. Steady-state ALA results $Di = 0.75 - 1$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1.25	1.779	17.385	26.438	16.675	0.495	0.886	0.899
VT	64x64	10^4	1.25	1.8202	17.9566	27.6953	17.5333	0.4944	0.9208	0.9207
CU	64x64r	10^4	1.25	1.8200	17.9000	27.7000	17.5000	0.4947	0.9210	0.9219
UM	60x68r	2×10^4	1.25	2.029	26.895	41.681	26.282	0.497	1.177	1.195
VT	64x64	2×10^4	1.25	2.0712	27.7083	43.2727	27.3967	0.4967	1.2146	1.2146
CU	64x64r	2×10^4	1.25	2.0700	27.6000	43.3000	27.4000	0.4969	1.2151	1.2166
UM	60x68r	5×10^4	1.25	2.36	43.465	70.45	43.666	0.501	1.581	1.604
VT	64x64	5×10^4	1.25	2.3919	44.4493	71.8972	44.6742	0.5006	1.6145	1.6147
CU	64x64r	5×10^4	1.25	2.3900	44.1000	71.9000	44.7000	0.5008	1.6163	1.6204
UM	60x68r	10^5	1.25	2.859	52.269	64.505	1.185	0.491	2.187	2.242
VT	64x64	10^5	1.25	2.5597	56.5646	96.4695	57.0013	0.5031	1.8492	1.8499
CU†	64x64r	10^5	1.25	2.8900	52.8000	64.3000	40.5000	0.4915	2.2390	2.2478
UM	60x68r	2×10^5	1.25	3.424	78.121	102.7	1.135	0.493	2.879	2.958
VT†	64x64	2×10^5	1.25	3.4626	79.8860	102.7942	0.0000	0.4933	2.9410	2.9422
CU†	64x64r	2×10^5	1.25	3.4600	78.5000	102.7000	64.6000	0.4933	2.9472	2.9651
UM†	60x68r	5×10^5	1.25	no result reported						
VT†	64x64	5×10^5	1.25	4.2500	120.7501	177.4668	0.0000	0.4941	3.9622	3.9656
CU†	64x64r	5×10^5	1.25	4.2400	117.6000	177.5000	109.9000	0.4938	3.9817	4.0270
UM	60x68r	10^6	1.25	no result reported						
VT	64x64	10^6	1.25	no convergence to steady state						
CU	64x64r	10^6	1.25	no convergence to steady state						
UM	60x68r	10^4	1.5	1.285	9.835	16.242	9.683	0.479	0.393	0.396
VT	64x64	10^4	1.5	1.3107	10.2396	17.2320	10.3023	0.4783	0.4166	0.4167
CU	64x64r	10^4	1.5	1.3100	10.2000	17.2000	10.3000	0.4786	0.4167	0.4174
UM	60x68r	2×10^4	1.5	1.391	15.99	26.831	15.746	0.476	0.579	0.579
VT	64x64	2×10^4	1.5	1.4213	15.6609	26.7156	15.4916	0.4760	0.5713	0.5715
CU	64x64r	2×10^4	1.5	1.4200	15.6000	26.7000	15.5000	0.4763	0.5720	0.5733
UM	60x68r	5×10^4	1.5	1.758	28.758	51.953	18.826	0.495	1.236	1.19
VT	64x64	5×10^4	1.5	1.5695	25.0036	44.5456	23.8607	0.4742	0.7901	0.7905
CU†	64x64r	5×10^4	1.5	1.7100	23.4000	29.5000	18.6000	0.4621	0.9910	0.9944
UM†	60x68r	10^5	1.5	1.973	36.141	47.779	0.29	0.461	1.362	1.406
VT†	64x64	10^5	1.5	1.9972	37.1300	48.3021	0.0000	0.4609	1.3977	1.3985
CU†	64x64r	10^5	1.5	2.0000	36.6000	48.3000	30.2000	0.4611	1.4009	1.4080
UM†	60x68r	2×10^5	1.5	2.306	53.947	76.153	0.136	0.46	1.863	1.93
(VT†)	64x64	2×10^5	1.5	2.3306	55.4384	76.9096	0.0000	0.4605	1.8944	1.8959
CU†	64x64r	2×10^5	1.5	2.3300	54.4000	76.9000	47.7000	0.4606	1.9004	1.9141
UM†	60x68r	5×10^5	1.5	no result reported						
VT†	64x64	5×10^5	1.5	2.8077	86.2791	133.5982	0.0000	0.4600	2.6256	2.6296
CU†	64x64r	5×10^5	1.5	2.8000	83.9000	133.7000	80.7000	0.4599	2.6473	2.6804
UM	60x68r	10^6	1.5	no result reported						
VT	64x64	10^6	1.5	no convergence to steady state						
CU	64x64r	10^6	1.5	no convergence to steady state						

†two cell or mixed-mode solution

Table 14. Steady-state ALA results $Di = 1 - 1.5$.

Code	Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	10^4	1.75	no result reported						
VT	64x64	10^4	1.75	1.1087	5.6011	11.6070	6.6056	0.4786	0.1773	0.1774
CU	64x64r	10^4	1.75	no result						
UM	60x68r	2×10^4	1.75	no result reported						
VT	64x64	2×10^4	1.75	1.1678	9.1330	18.7729	10.1553	0.4709	0.2731	0.2733
CU	64x64r	2×10^4	1.75	no result reported						
UM	60x68r	5×10^4	1.75	no result reported						
VT†	64x64	5×10^4	1.75	1.3158	15.2527	22.8298	0.0000	0.4487	0.5109	0.5114
CU	64x64r	5×10^4	1.75	no result reported						
UM	60x68r	10^5	1.75	no result reported						
VT†	64x64	10^5	1.75	1.4318	23.6624	36.1449	0.0000	0.4391	0.7063	0.7072
CU	64x64r	10^5	1.75	no result reported						
UM	60x68r	2×10^5	1.75	no result reported						
VT†	64x64	2×10^5	1.75	1.5795	35.3013	56.0252	0.0000	0.4327	0.9618	0.9636
CU	64x64r	2×10^5	1.75	no result reported						
UM	60x68r	5×10^5	1.75	no result reported						
VT†	64x64	5×10^5	1.75	1.8236	57.1250	97.1252	0.0000	0.4278	1.3926	1.3968
CU	64x64r	5×10^5	1.75	no result reported						
UM	60x68r	10^6	1.75	no result reported						
VT†	64x64	10^6	1.75	2.0272	79.3737	142.6095	0.0000	0.4256	1.7570	1.7653
CU	64x64r	10^6	1.75	no result reported						
UM	60x68r	10^4	2	no result reported						
VT	64x64	10^4	2	1.0000	0.0001	0.0000	0.0000	0.5000	0.0000	0.0002
CU	64x64r	10^4	2	1.0000	0.0000	0.0000	0.0000	0.5000	0.0000	0.0000
UM	60x68r	2×10^4	2	no result reported						
VT	64x64	2×10^4	2	1.0784	5.8394	14.0303	7.1726	0.4817	0.1478	0.1481
CU	64x64r	2×10^4	2	1.0900	5.8000	14.1000	7.2000	0.4837	0.1496	0.1501
UM	60x68r	5×10^4	2	no result reported						
VT†	64x64	5×10^4	2	1.1718	10.8346	19.1455	0.0000	0.4602	0.3176	0.3183
CU†	64x64r	5×10^4	2	1.1800	10.8000	19.2000	12.1000	0.4611	0.3195	0.3209
UM	60x68r	10^5	2	no result reported						
VT†	64x64	10^5	2	1.2344	17.0521	30.2104	0.0000	0.4493	0.4366	0.4377
CU†	64x64r	10^5	2	1.2400	16.9000	30.3000	18.8000	0.4500	0.4386	0.4408
UM	60x68r	2×10^5	2	no result reported						
VT†	64x64	2×10^5	2	1.2988	25.3235	45.8115	0.0000	0.4394	0.5633	0.5655
CU†	64x64r	2×10^5	2	1.3000	24.9000	45.8000	27.9000	0.4396	0.5644	0.5683
UM	60x68r	5×10^5	2	no result reported						
VT†	64x64	5×10^5	2	1.3899	40.1472	76.5227	0.0000	0.4271	0.7503	0.7550
CU†	64x64r	5×10^5	2	1.3900	39.1000	76.5000	44.7000	0.4270	0.7522	0.7603
UM	60x68r	10^6	2	no result reported						
VT†	64x64	10^6	2	1.4591	54.6776	109.4483	0.0000	0.4188	0.8948	0.9036
CU†	64x64r	10^6	2	1.4500	52.8000	109.3000	60.6000	0.4179	0.8977	0.9111

†two cell or mixed-mode solution

Table 15. Steady-state ALA results $Di = 1.75 - 2$

Resolution	Ra	Di	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$
32x32	10^4	0.25	4.4300	40.4163	58.8460	39.3323	0.5127
64x64	10^4	0.25	4.4262	40.2147	58.7413	39.3012	0.5127
96x96	10^4	0.25	4.4254	40.1551	58.7313	39.2953	0.5127
128x128	10^4	0.25	4.4251	40.1267	58.7250	39.2932	0.5127
32x32	10^4	0.5	3.8664	36.6484	54.4210	36.1366	0.5187
64x64	10^4	0.5	3.8636	36.4615	54.3161	36.1033	0.5188
96x96	10^4	0.5	3.8630	36.4068	54.2966	36.0971	0.5188
128x128	10^4	0.5	3.8628	36.3808	54.2898	36.0948	0.5189
32x32	10^4	1	2.5698	26.2434	40.6833	26.4722	0.5087
64x64	10^4	1	2.5674	26.1065	40.6184	26.4318	0.5088
96x96	10^4	1	2.5669	26.0686	40.5994	26.4242	0.5089
128x128	10^4	1	2.5667	26.0511	40.5939	26.4216	0.5089

Table 16. Grid resolution study for constant viscosity problems using VT code.

Code	Resolution	Di	Approximation	Nu	V_{rms}	$V_{surf-max}$	$\langle V_{surf} \rangle$	$\langle T \rangle$	$\langle \phi \rangle$	$\langle W \rangle$
UM	60x68r	0	ALA	10.041	478.600	143.000	98.200		0.000	0.000
VT	64x64	0	ALA	10.076	495.080	143.780	98.761	0.741	0.000	0.000
CU	64x64r	0	ALA	10.060	485.300	144.100	98.900	0.740	0.000	0.000
CT	64x64	0	TALA	10.079	485.860	143.763	98.748	0.741	0.000	0.000
CZ	70x70	0	TALA	10.060	490.940	138.530	95.150	0.752	0.000	0.000
KS	128x128	0	TALA	10.086	487.960	146.120	100.240	0.736	0.000	0.000
UM	60x68r	0.25	ALA	7.670	370.057	118.106	80.746	0.707	1.636	1.633
VT	64x64	0.25	ALA	7.710	381.690	118.600	81.090	0.707	1.644	1.647
CU	64x64r	0.25	ALA	7.680	371.700	118.500	81.000	0.706	1.643	1.650
CT	64x64	0.25	TALA	7.739	377.130	121.236	82.956	0.706	1.522	1.660
CZ	70x70	0.25	TALA	7.680	366.090	118.920	81.390	0.705	1.605	1.607
KS	128x128	0.25	TALA	7.796	374.150	122.340	83.729	0.704	1.653	1.635
UM	60x68r	0.5	ALA	5.424	238.631	86.455	58.703	0.658	2.101	2.106
VT	64x64	0.5	ALA	5.470	247.660	87.020	59.100	0.658	2.122	2.126
CU	64x64r	0.5	ALA	5.450	238.400	86.700	58.900	0.658	2.108	2.111
CT	64x64	0.5	TALA	5.526	244.390	90.989	61.944	0.657	2.026	2.158
CZ	70x70	0.5	TALA	5.520	238.240	90.320	61.490	0.655	2.089	2.075
KS	128x128	0.5	TALA	5.629	245.980	92.468	63.004	0.657	2.180	2.121
UM	60x68r	1	ALA	2.476	90.879	38.398	24.829	0.557	1.300	1.330
VT	64x64	1	ALA	2.520	96.790	39.460	25.560	0.557	1.352	1.358
CU	64x64r	1	ALA	2.390	89.500	16.800	10.700	0.556	1.257	1.267
CT	64x64	1	TALA	2.594	95.487	43.399	28.187	0.558	1.378	1.393
CZ	70x70	1	TALA	2.610	92.170	43.510	28.340	0.555	1.346	1.312
KS	128x128	1	TALA	2.663	93.893	44.601	29.115	0.558	1.443	1.354
UM	60x68r	1.25	ALA	1.650	46.188	22.897	14.053	0.508	0.692	0.716
VT	64x64	1.25	ALA	1.670	49.740	23.640	14.480	0.509	0.728	0.734
CU	64x64r	1.25	ALA	1.690	47.200	12.000	7.600	0.506	0.758	0.765
CT	64x64	1.25	TALA	1.722	49.082	26.365	16.078	0.510	0.762	0.751
CZ	70x70	1.25	TALA	1.710	46.310	25.700	15.690	0.508	0.701	0.680
KS	128x128	1.25	TALA	no result reported						
UM	60x68r	1.5	ALA	no steady solution						
VT	64x64	1.5	ALA	1.290	21.340	17.150	10.410	0.478	0.367	0.374
CU	64x64r	1.5	ALA	1.280	18.400	8.500	5.400	0.475	0.353	0.355
CT	64x64	1.5	TALA	1.328	21.942	19.483	11.756	0.478	0.402	0.386
CZ	70x70	1.5	TALA	1.290	19.540	18.290	10.990	0.475	0.341	0.328
KS	128x128	1.5	TALA	no result reported						
UM	60x68r	2	ALA	no steady solution						
VT	64x64	2	ALA	1.000	0.000	0.000	0.000	0.500	0.000	0.000
CU	64x64r	2	ALA	1.000	0.000	0.000	0.000	0.500	0.000	0.000
CT	64x64	2	TALA	no steady solution						
CZ	70x70	2	TALA	no result reported						
KS	128x128	2	TALA	no result reported						

Table 17. Steady-state temperature-dependent results using equation ?? for viscosity with $Ra = 1.0^4$ and $Di = 0 - 2.0$.