

Figure 1: 256^3 , $\nu = 1 \times 10^{-3}$, 0.05, irrotational forcing: $f = 0.5$ and $f = 4.0$.

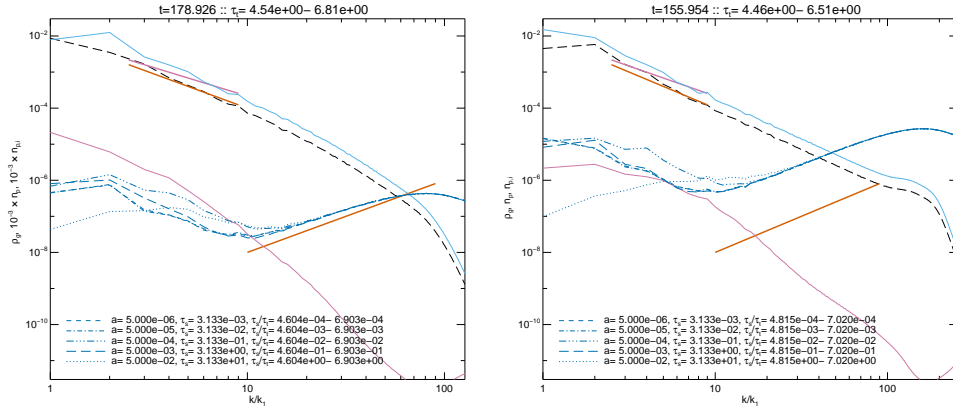


Figure 2: 256^3 , 512^3 , $\nu = 1 \times 10^{-3}$, 5×10^{-4} , irrotational forcing: $f = 0.5$.

$$\tau_s = \sqrt{\frac{\pi}{8}} \frac{\rho_{gr}}{\rho} \frac{a}{c_s}, \tau_K = \frac{\nu}{u_{rms}}, \tau_t = \frac{k_F}{u_{rms}} = \frac{3.1 \times 0.5}{u_{rms}}, \tau_{Kolmogorov} = \left(\frac{\rho \nu^3}{\varepsilon_{kin}} \right)^{\frac{1}{4}}, Re = \frac{u_{rms} \delta x}{\nu}$$

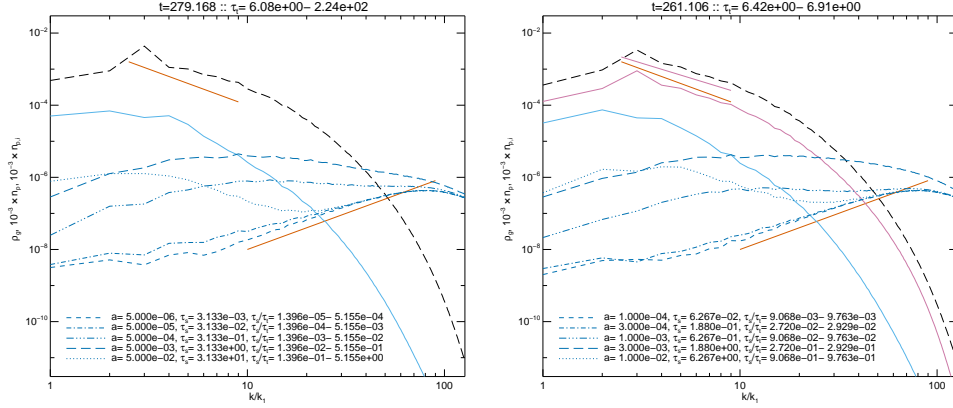


Figure 3: 256^3 , $\nu = 1.0 \times 10^{-3}$, vortical forcing: $f = 0.02$, Weinstein transonic vs. Stokes drag.

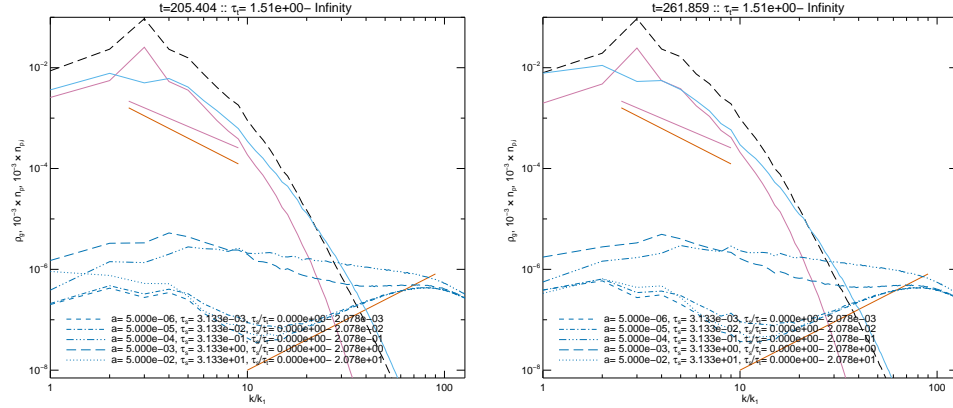


Figure 4: 256^3 , $\nu = 2.0 \times 10^{-2}$, vortical forcing: $f = 0.2$, $t = 205$ and $t = 262$.

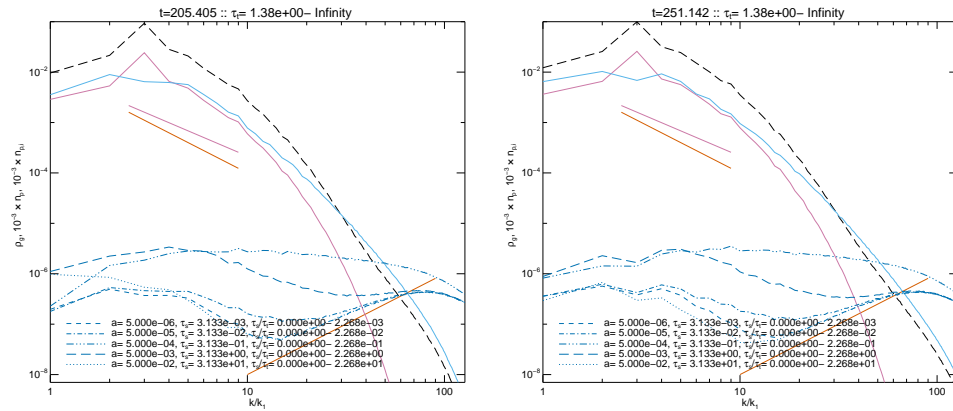


Figure 5: 256^3 , $\nu = 1.0 \times 10^{-2}$, vortical forcing: $f = 0.2$, $t = 205$ and $t = 251$.

Table 1: $m = 10^{-3}$, $\mu = 10^{-6}$

f	dtf	ν [10^{-3}]	ν_s	u_{rms}	divu2m	rdivum	rhodisp	ω_{rms}	comment
1.0	1.0	5.0	2	0.4–0.8	2.285		0.218	0.30–0.75	$t_{\text{max}} = 143, n_a = 10, 512^3$
1.0	0.9	5.0	2	0.4–0.8				0.30–0.80	$t_{\text{max}} = 171, n_a = 10, 512^3$
1.0	0.5	5.0	2	0.4–0.9	6.003		0.372	0.30–0.97	$t_{\text{max}} = 180, n_a = 10, 512^3$
2.0	1.0	5.0	2	0.7–1.2	5.975		0.337	1.00–1.80	$t_{\text{max}} = 113, n_a = 10, 512^3$
4.0	1.0	5.0	2	1.3–2.2	46.45		1.212	2.3–4.4	$t_{\text{max}} = 72, n_a = 10, 512^3$
0.1	1.0	1.8	2	0.06–0.08	9–17m		97m	650–800 μ	$t_{\text{max}} = 200, n_a = 20, 512^3$
0.5	1.0	1.8	2	0.16–0.22	0.18–0.24		30m	25–36m	$t_{\text{max}} = 150, n_a = 20, 512^3$
0.5	1.0	1.8	2	0.16–0.22	0.18–0.25		29m	25–36m	$t_{\text{max}} = 150, n_a = 3, 512^3$
0.5	1.0	1.8	0	0.16–0.22	0.35–0.55		20m	17–27m	$t_{\text{max}} = 139, n_a = 20, 512^3$
1.0	1.0	1.8	2	0.25–0.32	0.48–0.64		97m	80–150m	$t_{\text{max}} = 120, n_a = 20, 512^3$
2.0	1.0	1.8	2	0.41–0.58	1.1–1.9		0.240	400–700m	$t_{\text{max}} = 100, n_a = 20, 512^3$
0.5	1.0	5.4	2	0.14–0.22	50–75m	< 0.005	25m	12–19m	$t_{\text{max}} = 162, n_a = 3, 128^3$
0.5	1.0	2.0	0	0.15–0.22	21–34m	< 0.005	–49m	10–22m+	$t_{\text{max}} = 147, n_a = 3, 128^3$
0.5	1.0	1.0	0	0.15–0.22	40–63m	< 0.007	–50m	11–31m+	$t_{\text{max}} = 160, n_a = 3, 256^3$
0.5	1.0	4.0	0	0.15–0.22	12–18m	< 0.005	–40m	7–22m	$t_{\text{max}} = 150, n_a = 3, 64^3$
0.5	1.0	1.0	0	0.15–0.22	0.40–0.63	< 0.006		16–31m+	$t_{\text{max}} = 186, n_a = 5, 256^3$
0.5	1.0	5.0	0	0.15–0.22	0.13–0.22	< 0.006		11–21m	$t_{\text{max}} = 176, n_a = 5, 256^3$
0.5	1.0	5.0	0	0.186	0.191	34.0, 35.0	1.40	18.9m	$t_{\text{max}} = 215, n_a = 5, 256^3$
0.5	1.0	0.5	0	0.15–0.22	0.8–1.2	< 0.006		22–43m+	$t_{\text{max}} = 155, n_a = 5, 512^3$
0.5	0.5	2.0	0	0.19	0.45	35.7, 36.9	1.36	25m	$t_{\text{max}} = 213, n_a = 5, 512^3$
4.0	1.0	50.	0	0.62–0.89	0.80–2.10	< 0.0075		220–520	$t_{\text{max}} = 49, n_a = 5, 256^3$
4.0	1.0	20.	0	blow up					
0.02	1.0	1.0	0	0.14–0.17	0.8m+	< 30 μ		51–61m	$t_{\text{max}} = 279, n_a = 5, 256^3$
0.02	1.0	1.0	0	0.14–0.17	0.8m+	< 30 μ		53–61m	$t_{\text{max}} = 260, n_a = 5, 256^3$, Stokes drag
0.2	0.2	50.	0	0.82	1.70	52.3, 54.2	99.3m	336m	$t_{\text{max}} = 48, n_a = 5, 256^3$
0.2	0.5	50.	0	0.739	1.33	41.3, 39.4	70.6m	297m	$t_{\text{max}} = 55, n_a = 5, 256^3$
0.2	1.0	50.	0	0.43–0.52	25–38m	< 0.002		0.69–0.85	$t_{\text{max}} = 111, n_a = 5, 256^3$
0.2	1.0	20.	0	0.55–0.66	0.12–0.18	< 0.003		1.07–1.27	$t_{\text{max}} = 260, n_a = 5, 256^3$
0.2	1.0	10.	0	0.62–0.72	0.32–0.48	< 0.004		1.46–1.72	$t_{\text{max}} = 250, n_a = 5, 256^3$
0.5	1.0	2.0	0	0.15–0.22	22–34m	< 0.005		10–20m+	$t_{\text{max}} = 96, n_a = 5, 128^3$
1.0	1.0	1.0	0	0.24–0.34	1.7–2.4			0.07–0.34	no p., $t_{\text{max}} = 50, 512^3$
1.0	1.0	0.7	0	blow up					no p., $t_{\text{max}} = 16.76, 512^3$
1.0	1.0	0.5	0	blow up					no p., $t_{\text{max}} = 22.11, 512^3$
2.0	1.0	5.0	0	0.40–0.57	2.2–4.2			0.30–0.90	no p., $t_{\text{max}} = 50, 512^3$
2.0	1.0	4.0	0	blow up					no p., $t_{\text{max}} = 15.56, 512^3$
2.0	1.0	3.0	0	blow up					no p., $t_{\text{max}} = 14.25, 512^3$
2.0	1.0	2.0	0	blow up					no p., $t_{\text{max}} = 12.85, 512^3$
4.0	1.0	50.	0	0.60–0.85	1.0–2.2			0.35–0.53	no p., $t_{\text{max}} = 50, 512^3$
4.0	1.0	20.	0	blow up					no p., $t_{\text{max}} = 2.82, 512^3$
4.0	1.0	10.	0	blow up					no p., $t_{\text{max}} = 3.62, 512^3$
4.0	1.0	5.0	0	blow up					no p., $t_{\text{max}} = 2.77, 512^3$