The Reduction of Magnetic Reconnection Outflow Jets to Sub-Alfvénic Speeds: Supplementary Material

Colby C. Haggerty,[1,2,a)] Michael A. Shay,[2] Alexandros Chasapis,[2] Tai D. Phan,[3] James F. Drake,[4] Kittipat Malakit,[5] Paul A. Cassak,[6] and Rungployphan Kieokaew[7]

[1)] *Department of Astronomy and Astrophysics, University of Chicago, Chicago, IL 60637, USA*

[2)] *Bartol Research Institute, Department of Physics and Astronomy, University of Delaware, Newark, DE 19716, USA*

[3)] *Space Sciences Laboratory, University of California, Berkeley, California 94720, USA*

[4)] *Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, Maryland 20742, USA*

[5)] *Department of Physics, Faculty of Science and Technology, Thammasat University, Pathum Thani, Thailand*

[6)] *Department of Physics and Astronomy, West Virginia University, Morgantown, West Virginia 26506, USA*

[7)] *CGAFD, Mathematics, CEMPS, University of Exeter, Exeter, UK*

(Dated: 31 July 2018)

I. SIMULATIONS

Bellow we present the the initial parameters of the 81 different PIC simulations used in this study where m_i/m_e is the artificial ion to electron mass ratio, B_r is the magnitude of the reconnection component of the upstream magnetic field, B_g the upstream component of the magnetic field normal to the current sheet and the outflow direction called the guide field, n_{in} the initial upstream density, T_e and T_i the initial electron and ion temperature respectively and β_r the total plasma beta based on the reconnecting component of the magnetic field.

[a)] Electronic mail: CHaggerty@UChicago.edu

Run	m_i/m_e	B_r	B_g	n_{in}	T_e	T_i	β_r
14	25.0	1.0	0.0	0.04	0.25	2.25	0.20
15	25.0	1.0	0.0	0.04	1.0	9.0	0.80
16	25.0	1.0	0.0	0.04	1.8	9.0	0.86
17	25.0	1.0	0.0	0.04	9.0	9.0	1.44
20	25.0	1.0	0.0	0.2	22.5	2.5	10.0
301	25.0	1.0	0.0	0.2	0.25	0.25	0.20
302	25.0	1.0	1.0	0.2	0.25	0.25	0.20
303	25.0	1.0	0.0	0.2	2.25	0.25	1.00
304	25.0	1.0	1.0	0.2	2.25	0.25	1.00
305	25.0	1.0	0.0	0.2	0.25	2.25	1.00
306	25.0	1.0	1.0	0.2	0.25	2.25	1.00
307	25.0	1.0	0.0	1.0	0.25	0.25	1.00
309	25.0	1.0	0.0	0.04	2.25	0.25	0.20
310001	25.0	2.236	0.0	0.2	2.25	0.25	0.20
312001	25.0	0.447	0.447	0.2	0.25	0.25	1.00
313	25.0	1.0	1.0	0.04	2.25	0.25	0.20
314001	25.0	2.236	2.236	0.2	2.25	0.25	0.20
318001	25.0	2.236	2.236	0.2	0.25	2.25	0.20
319	25.0	0.447	0.0	0.2	2.25	0.25	5.00
320	25.0	0.447	0.447	0.2	2.25	0.25	5.00
323	25.0	1.0	0.0	0.2	1.25	0.25	0.60
324	25.0	1.0	1.0	0.2	1.25	0.25	0.60
325	25.0	1.0	0.0	0.2	0.3125	0.0625	0.15
326	25.0	1.0	1.0	0.2	0.3125	0.0625	0.15
327	25.0	1.0	0.0	0.2	5.0	1.0	2.40
328	25.0	1.0	1.0	0.2	5.0	1.0	2.40
601	25.0	1.0	0.0	0.2	1.25	0.25	0.60
602	25.0	0.447	0.0	0.2	1.25	0.25	3.00
603	25.0	2.236	0.0	0.2	1.25	0.25	0.12
604	25.0	1.0	1.0	0.2	1.25	0.25	0.60
621	25.0	1.0	0.0	0.2	1.25	0.25	0.60
622	25.0	0.447	0.0	0.2	1.25	0.25	3.00
623	25.0	2.236	0.0	0.2	1.25	0.25	0.12
624	25.0	1.0	1.0	0.2	1.25	0.25	0.60
625	25.0	0.447	0.447	0.2	1.25	0.25	3.00
626	25.0	2.236	2.236	0.2	1.25	0.25	0.12
629	25.0	0.75	1.0	0.2	1.25	0.25	1.07
632	25.0	1.0	0.5	0.2	1.25	0.25	0.60

Run	m_i/m_e	B_r	B_g	n_{in}	T_e	T_i	β_r
633	25.0	1.0	0.75	0.2	1.25	0.25	0.60
634	25.0	1.0	0.083	0.2	1.25	0.25	0.60
635	25.0	1.0	0.167	0.2	1.25	0.25	0.60
641	25.0	1.0	0.0	0.2	1.0	1.0	0.80
642	25.0	1.0	0.25	0.2	1.0	1.0	0.80
644	25.0	1.0	0.75	0.2	1.0	1.0	0.80
645	25.0	1.0	1.0	0.2	1.0	1.0	0.80
646	25.0	1.0	0.08	0.2	1.0	1.0	0.80
647	25.0	1.0	0.17	0.2	1.0	1.0	0.80
651	25.0	2.24	0.0	0.2	6.25	1.25	0.60
652	25.0	0.45	0.0	0.2	0.25	0.05	0.59
655	25.0	1.0	0.0	0.04	6.25	1.25	0.60
657	25.0	0.45	0.0	0.04	1.25	0.25	0.59
661	25.0	1.673	0.0	0.2	3.5	0.7	0.60
662	25.0	0.74833	0.0	0.04	3.5	0.7	0.60
671	25.0	1.0	0.0	0.2	0.75	0.75	0.60
672	25.0	0.447	0.0	0.2	0.15	0.15	0.60
673	25.0	2.236	0.0	0.2	3.75	3.75	0.60
674	25.0	1.0	0.0	0.2	1.35	0.15	0.60
675	25.0	0.447	0.0	0.2	0.27	0.03	0.60
676	25.0	2.236	0.0	0.2	6.75	0.75	0.60
681	25.0	0.447	0.45	0.2	0.25	0.05	0.60
682	25.0	2.236	2.24	0.2	6.25	1.25	0.60
691	25.0	2.236	0.0	0.2	1.25	1.25	0.20
692	25.0	0.447	0.0	0.2	0.05	0.05	0.20
693	100.0	1.0	0.0	0.2	0.25	0.25	0.20
694	25.0	1.0	0.0	0.2	0.25	0.08	0.13
695	25.0	1.0	0.0	0.2	0.08	0.25	0.13
701	100.0	1.0	0.0	0.2	1.25	0.25	0.60
702	100.0	1.0	1.0	0.2	1.25	0.25	0.60
703	100.0	0.447	0.0	0.2	1.25	0.25	3.00
705	100.0	2.236	0.0	0.2	1.25	0.25	0.12
706	100.0	2.236	2.236	0.2	1.25	0.25	0.12
707	100.0	1.0	0.0	0.2	0.3125	0.0625	0.15
708	100.0	1.0	1.0	0.2	0.3125	0.0625	0.15
712	100.0	2.24	0.0	0.2	6.25	1.25	0.60
714	100.0	1.67	0.0	0.2	3.5	0.7	0.60
715	100.0	0.748331	0.0	0.04	3.5	0.7	0.60
804	400.0	1.0	0.0	0.2	1.25	0.25	0.60
901	25.0	2.236	0.0	0.2	0.25	2.25	0.20
904	100.0	2.236	0.0	0.2	0.25	2.25	0.20
930	25.0	1.0	0.0	0.04	0.45	2.25	0.22
935	25.0	1.0	0.0	0.04	0.25	0.25	0.04