

Legends for Supplementary Videos:

Supplementary Video 1 (track_76.mov): trajectory of a sample counter stream electron in interaction with evolving fields of magnetic dipole corresponding to electron energization scenario 1 in the paper.

Supplementary Video 2(track_70.mov) : trajectory of a sample counter stream electron in interaction with evolving fields of magnetic dipole corresponding to electron energization scenario 2 in the paper.

Supplementary Video 3 (track_74.mov): trajectory of a sample incoming electron in interaction with evolving fields of magnetic dipole corresponding to electron energization scenario 3 in the paper.