

Nonrelativistic shocks of young supernova remnants in kinetic simulations

Tuesday, 27 October 2015 15:45 (15 minutes)

The formation, electromagnetic structure, and the injection of suprathermal particles into a Fermi-type acceleration at collisionless shocks constitute important problems of high-energy astrophysics. We report on recent particle-in-cell studies of high Mach-number nonrelativistic perpendicular shocks in applications to young supernova remnants. We discuss a nonlinear shock structure mediated by Weibel-type filamentation instabilities, shock reformation and rippling, and conditions leading to heating and efficient electron and ion pre-acceleration. First results of oblique quasi-perpendicular shock studies will also be presented.

Primary author: Prof. NIEMIEC, Jacek (Institute of Nuclear Physics Polish Academy of Sciences)

Co-authors: Mr BOHDAN, Artem (Institute of Nuclear Physics PAS); Dr NISHIKAWA, Ken-Ichi (University of Alabama in Huntsville); Prof. POHL, Martin (University of Potsdam and DESY-Zeuthen); Dr KOBZAR, Oleh (Institute of Nuclear Physics PAS); Dr WIELAND, Volkmar (University of Potsdam)

Presenter: Prof. NIEMIEC, Jacek (Institute of Nuclear Physics Polish Academy of Sciences)

Session Classification: Cosmic Rays

Track Classification: High Energy Cosmic rays