

**Microinstabilities generated in the foot of a high Mach number quasi-perpendicular shock**

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It is known that a variety of microinstabilities get excited due to the presense of reflected ions in the foot of a high Mach number quasi-perpendicular shock. In our previous case study, two dimensional PIC simulation revealed that the modified two-stream instability and the following electron acoustic instability can be dominant for typical parameters in the terrestrial bow shock. In the present study, dependence of excited wave energy on shock parameters, especially the angle between upstream magnetic field and shock normal direction, is reported. Furthermore, efficiency of particle heating due to wave-particle interactions is discussed.