

## Production Process of Reflected Ion at Parallel Shock

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Although the particle acceleration process at the (quasi-)parallel shock is widely discussed, the initial acceleration processes from thermal to suprathermal ions have been under consideration. It is also unsolved how the (quasi-)parallel shocks produce the necessary heating at the shock front. Here we propose a new view of the wave-particle interaction process around the (quasi-)parallel shock and explain the production mechanism of the suprathermal ions from incoming fluid population. Instead of the random waves, large-amplitude waves are superposed at the shock transition layer. Most of these suprathermal ions contribute the downstream heating. A part of ions, however, returns to upstream region after acceleration at the vicinity of the shock.