

## 垂直衝撃波の流体モデル

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### **Multi-fluid modeling of quasi-perpendicular shocks**

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We model the macro-structure of quasi-perpendicular shocks in the super-critical regime in the framework of a fluid model. We treat the incoming, the reflected, and the transmitted ions as independent elements of a multi-fluid, whereas the electrons as charge neutralizing background. Previous study by Leroy (1983) showed that the multi-fluid description can explain a number of features exhibited by hybrid simulations, including the morphology of the reflected- gyrating ion stream and the dependence of the shock structure to the Mach number. On the other hand, since time stationarity was assumed in his model, it was not able to describe nonstationary features which may be intrinsic to high Mach number shocks. We discuss structure and stability of high Mach number perpendicular shocks and the self-reformation of perpendicular shock front, which has been observed in full particle simulations.