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C 会場 ： 11/25　PM1（13:45-15:45）
15:00〜15:15:00

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Rankine-Hugoniot equations in anisotropic plasmas: Application to the heliospheric termination shock

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The compression ratio, defined as the density jump across a shock, is a key parameter characterizing shock properties. In the fluid description, the Rankine – Hugoniot (RH) relations enforce conservation of mass, momentum, and energy, while Maxwell's equations ensure continuity of the tangential electric field and normal magnetic field. These constraints allow the compression ratio to be expressed in terms of upstream parameters such as Mach number and plasma beta. Using hybrid simulations including pickup ions (PUIs) to model the heliospheric termination shock, we find that the observed compression ratio is systematically lower than predicted by the standard RH relations, indicating a breakdown of their underlying assumptions. To address this, we incorporate plasma pressure anisotropy by treating pressure as a tensor rather than a scalar, and we modify the flux formulations for momentum and energy accordingly. Employing the Chew – Goldberger – Low (CGL) approximation to close the system, we derive new expressions for the compression ratio and pressure anisotropy. The resulting solutions show excellent agreement with simulation results when solar wind protons and PUIs are treated as a single fluid, demonstrating the validity of the anisotropic RH framework for shocks in space plasmas.