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Generalized Fluid Models for Collisional Multi-Ion Plasmas: Developments and Applications

Min Uk Lee

Department of Semiconductor Engineering

e-mail (speaker): min.uk.lee@mju.ac.kr

Multi-ion plasmas are commonly found in various domains of plasma science, such as fusion reactors, processing chambers, and space environments. Unlike single-ion plasmas, theoretical models for multi-ion systems are significantly more complex, primarily due to the Coulomb collisions between different ion species, which play a crucial role in plasma dynamics. Recent advancements have led to the development of a highly accurate and generalized fluid model that accounts for collisions between arbitrary ion species. This presentation will provide a concise overview of fluid models for multi-ion plasmas, emphasizing their significance and applicability. Additionally, the current state of research and plans for future extensions will be discussed.

References

- [1] M. U. Lee, J.-Y. Ji, and H. J. Lee, *Phys. Plasmas* **30**, 112101 (2023)
- [2] J.-Y. Ji, *Plasma Phys. Control. Fusion* **65**, 075014 (2023)