

Abstract Submitted
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Is the Bohm Criterion satisfied in magnetized plasmas, and how does ion-neutral collisionality matter?¹ GREG SEVERN, Dept. of Physics, University of San Diego, JONATHAN GREEN, VICTORIA WINTERS, CHISHUNG YIP, NOAH HERSHKOWITZ, OLIVER SCHMITZ, Dept. of Engineering Physics, University of Wisconsin-Madison — It is taken for granted that the usual Bohm criterion must be satisfied for weakly collisional, magnetized plasmas at the plasma-wall boundary for the case in which the magnetic field is normally incident on the boundary, but there is a paucity of experimental works that confirm it. Beyond this, theorists view the Bohm criterion as approximately true, holding only for collisionless plasmas. The question is whether Bohm's criterion really is satisfied in weakly collisional magnetized plasmas in the simplest case ($\hat{\mathbf{n}} \parallel \mathbf{B}/B$, where $\hat{\mathbf{n}}$ is the boundary surface normal vector) and how that criterion (the ions reaching a sonic point at the end of the presheath) is modified as collisionality rises. Experiments are conducted in a linear magnetized helicon plasma source at the University of Wisconsin, Madison, an upgraded version of MARIA (MARIA-Magnetized Anisotropic Ion-distribution Apparatus), in order to address these questions. Experimental results are discussed in light of relevant theoretical works.

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Greg Severn
University of San Diego

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