

Abstract Submitted  
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**Plasma sheath dynamics for high-temperature low-density plasmas**<sup>1</sup> XIANZHU TANG, NATALIA KRASHENINNIKOVA, VADIM ROYTERSHTEYN, LANL — With an absorbing material wall, the plasma is thought to be able to access a state of high temperature but low density. This can lead to an interesting edge condition for magnetically confined plasmas and possibly new confinement regimes. The implication for tokamak plasmas has been recognized in recent years. The earlier concept of tandem mirrors depends on essentially the same physics for accessing high electron temperature. As a first step to understand such a plasma, we revisit the classical unmagnetized plasma sheath using a kinetic approach. Although kinetic simulation using VPIC [1] gives a full account of the physical processes, an emphasis of our approach is on how to interpret the unexpected plasma behavior from kinetic simulations (compared with conventional electrostatic sheath theory) using the fluid-moment formulation. [1] K. Bowers, et al., Phys. Plasmas 15, 055703 (2008).

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