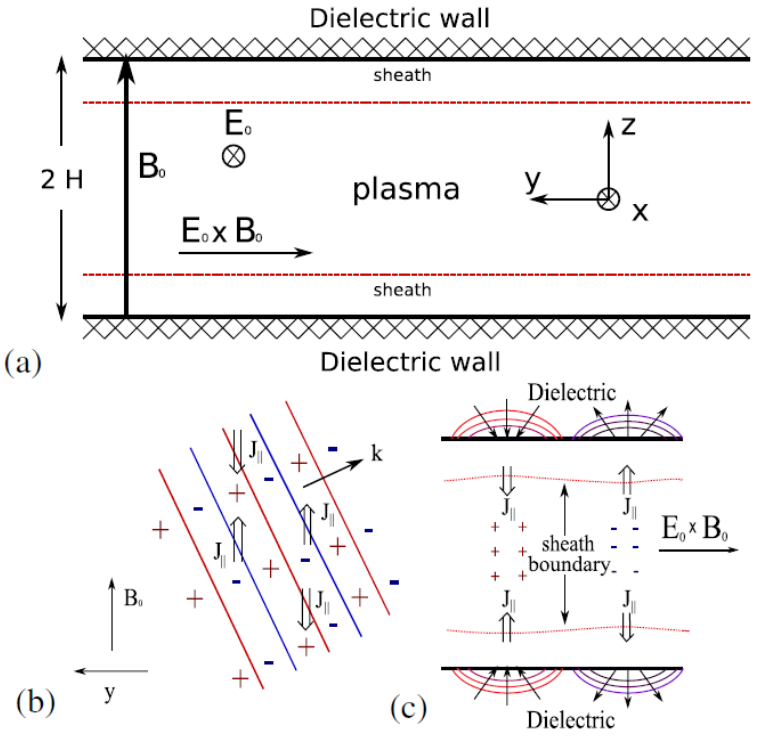
SHEATH-INDUCED INSTABILITIES IN MAGNETIZED PLASMAS

- A new instability was identified that can explain possible mechanisms of anomalous transport in magnetized plasmas.
- Ion acoustic waves in plasmas of finite size with E×B electron drift become unstable due to the closure of plasma current in the chamber wall.
- The instability is sensitive to the wall material: a high value of the dielectric permittivity of the wall material reduces the mode growth rate by an order of magnitude. This theoretical study may explain previous experimental findings that wall material may strongly affect Hall thruster operation.



- (a) Geometry of the plasma; (b) Perturbed parallel current in infinite plasma by an oblique wave with respect to the magnetic field; (c) Perturbed current in bound plasma.