

Ion triggered instabilities in magnetized plasmas and dusty plasmas  
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In fusion, space, and laboratory plasmas, ion flow is an important free energy source that can be a heating mechanism for the plasma as well as providing a driving mechanism for many low frequency instabilities. For the past decade, the Plasma Sciences Laboratory has performed a series of basic experiments to understand the role of ion flow in low temperature plasmas. In this presentation, a summary of results from two different studies will be presented. In the first study, results are presented on the role of sheared ion flows in the generation and suppression of ion cyclotron instabilities. These studies are performed using our 180 cm long, magnetized plasma column, ALEXIS. In the second study, the role of ions in the generation and control of dust acoustic waves is discussed. These studies are performed using our DC glow discharge dusty plasma experiment device, 3DPX. At the end of this talk, it will be shown that these two very different topics may come together in trying to understand the role of charged dust in future fusion experiments.