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**Session PP1 - Poster Session VIII.**

*POSTER session, Thursday afternoon, November 18  
Exhibit Hall A, SCC*

**[PP1.126] Theory and Simulation of a Nonlinear Fluid Model  
for Void Formation in Dusty Plasmas**

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A void in a dusty plasma is typically a small and stable centimeter-size region within the plasma that is completely free of dust particles and characterized by sharp boundaries. We present new developments in the theory and numerical simulation of a recently proposed [Phys. Rev. Lett. 90, 075001 (2003)] nonlinear time-dependent fluid model for void formation. This model consists of an initial instability caused by the ion drag and a nonlinear saturation mechanism to a state containing a void. General features of this model have been confirmed in both 1D and 2D numerical simulations. We report further developments of this model, including the effect of convective dust nonlinearity, a more complete momentum equation for ions, and more realistic boundary conditions, in both 1D and 2D. Analytical as well as numerical results will be presented.

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