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Formation of imposed patterns in a strongly magnetized plasma: A numerical Approach MOHAMAD MENATI, EDWARD J THOMAS, UWE KONOPKA, Auburn University — The formation of imposed patterns due to placing a metal wire mesh in the bulk of a strongly magnetized ($B \geq 1\ T$) plasma is investigated numerically. A 3D fluid model is developed to self-consistently solve the plasma fluid equation along with the Poisson's equation. Simulations using this model are able to qualitatively reproduce experimental observations. It is shown through these simulations that, due to the presence of the wire mesh in the bulk of the magnetized plasma, an organized pattern appears in the plasma potential. The emergence of this spatial pattern in the potential is due to the effect of the magnetic field on the cross-field transport of the electrons and ions. The potential structure is extended in the plasma along the applied magnetic field. It is proposed that this process is responsible for the formation of gridding phenomenon in magnetized dusty plasma experiments. This work is supported with funding from the U.S. Department of Energy, NASA, and the National Science Foundation (Physics Division and EPSCoR Office).

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