

P5.2002 Interaction of plasma flows and magnetic field with the formation of shock waves in nested arrays

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See the full abstract here <http://ocs.ciemat.es/EPS2019ABS/pdf/P5.2002.pdf>

The results of plasma compression studies of nested wire and fiber arrays with current flowing through them are presented in this work. Experiments were made on the Angara-51 installation with current up to 4 MA. The current implosion of nested arrays represents a unique opportunity to simulate the interaction of a plasma flow with a magnetic field. Inside the volume of such an array, there is a collision of the supersonic plasma flow from the external wire array produced by the current flowing through it with the magnetic field generated by a part of the total discharge current flowing through the inner array. Various plasma flow regimes in the space between the inner and outer arrays were obtained: sub-Alfven ($V_r < V_A$), super-Alfven ($V_r > V_A$) and the regime with the formation of a transition region: a shock wave (SW) between the arrays, depending on the ratio of the radii of the nested arrays. The dependence of these flow regimes on the parameters of the arrays is studied. The results are compared with the results of 2D and 3D dimensional radiation magnetohydrodynamic code MARPLE. A possible scenario for the interaction of plasma in the nested array pinch and the generation of a short-time soft X-ray pulse. Further optimization of the parameters of the nested array of mixed

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