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Laser-Plasma simulations of Artificial Magnetosphere formed by Giant Coronal Mass Ejections[1] YURI ZAKHAROV, ARNOLD PONOMARENKO, Institute of Laser Physics, Russia, KONSTANTIN VCHIVKOV, Institute of Laser Physics, WENDELL HORTON, PARRISH BRADY, University of Texas, ILP TEAM, UT TEAM — We study by the laboratory (Laser-Plasmas, LP) and numerical (3D/PIC-code) simulations a resulting state of very strong magnetopause' (MP) compression by CME with effective energy Eo $> 10^{34}$ ergs directed to the Earth. During probable formation of such Artificial Magnetosphere (AM) with the MP stand-off at Rm up to (2-3)R_E, a lot of catastrophic phenomena in a space and ground networks could occur due to very high curl electric fields induced by world-wide magnetic field's changes with a SC-rate $>$ 50 nT/s. The laboratory models of AM (with Rm $\sim$ 0,1-30 cm) were formed around high-field, 1D and 3D magnetic obstacles, overflowing by LP-blobs with Eo up to kJ and magnetized ions. The shape and internal structure of such large-scale AM at KI-1 facility of Russian team were studied by a set of B-dot magnetic probes, while a main goal of UT' small-AM experiment was to explore a possible shock's generation and relevant electron accelerations. A preliminary results of KI-1 experiments show that the both Rm-size and SC(Eo) of AM could be described by modified Chapman-Ferraro Scaling, while the whole SC-distribution (in equatorial plane) by well-known "Image Dipole" model of the Earth magnetosphere.

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