Contribution ID : **92** Type : **Oral talk**

Impact of primordial plasma on the collapse of bubble walls and primordial black hole formation

Thursday, 29 October 2026 10:30 (15)

The interaction of a closed domain wall with the primordial plasma during the radiation-dominated stage of the Universe is studied. When the plasma temperature drops below a threshold value determined by the wall potential parameters, the wall becomes opaque, trapping plasma inside. Relativistic hydrodynamic simulations of the trapped plasma and the wall dynamics are performed. The criterion for the wall to remain spherical during collapse is established, justifying the use of the thin-wall equation of motion. The pressure of the trapped plasma is shown to counteract the surface tension and, for a certain range of parameters, to prevent the collapse into a primordial black hole, causing the wall to bounce and launch a shock wave into the surrounding plasma. The propagation distance of this shock wave and the associated heating of the external medium are estimated.

Primary author(s) : FILIPPOV, Danila (NRNU MEPhI); KIRILLOV, Alexander (NRNU MEPhI)

Presenter(s) : FILIPPOV, Danila (NRNU MEPhI)

Session Classification : Gravitation and cosmology

Track Classification : Gravitation and cosmology