

Massive argon space telescope (MAST): concept and physical program

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Modern rocket launchers such as Falcon Heavy are able to lift up to 30–40 t payloads to medium (approximately 500 km) circular Earth orbits. Therefore, it is timely to consider a concept of a very massive space gamma-ray telescope that could in future serve as a successor to the Fermi-LAT instrument. We propose a new gamma-ray telescope called MAST (an abbreviation from “Massive Argon Space Telescope”) for the energy range of 100 MeV –1 TeV based on the liquid Argon time projection chamber technique [Dzhatdoev & Podlesnyi, *Astropart. Phys.*, 112, 1 (2019)]. We show that MAST could have the angular resolution 3-10 times better than the Fermi-LAT one and the differential sensitivity 10-30 times better than the Fermi-LAT one. Finally, we demonstrate the potential of the proposed instrument in several long-standing astrophysical problems [Dzhatdoev et al., *Phys. Rev. D*, 102, 123017 (2020); Khalikov & Dzhatdoev, arXiv:1912.10570].

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