

Abstract Submitted
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Using Solar Wind Data to Establish an Upper Bound on the Photon Mass D.D. RYUTOV, Lawrence Livermore National Laboratory, Livermore, CA 94551 — The currently accepted limit on the photon mass, $m < 10^{-49}g$ (W.-M. Yao and Particle Data Group. J. Phys. G, 33, 1, 2006), has been established based on the analysis of the Solar wind structure at the Earth orbit (D.D. Ryutov. PPCF, 39, A73, 1997). This approach is based on the analysis of the additional terms that appear in the MHD equations if m is finite. By using the observed data regarding an average magnetic field of the Solar wind, one finds that, at a large-enough photon mass these additional terms make the flow pattern completely different from really observed. When applied to the Solar wind data at the Pluto orbit, the same approach leads to an improved estimate, $m < 1.5 \times 10^{-51}g$ (D.D. Ryutov. PPCF, 49, B429, 2007). We consider data obtained by the Voyager mission in the zone between the Pluto orbit and the termination shock to further improve the estimate and find that the upper bound can be reduced by another factor of 5. Prepared by LLNL under Contract DE-AC52-07NA27344.

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