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A Search for Astrophysical Meter Wavelength Radio Transients SEAN CUTCHIN, JOHN SIMONETTI, Virginia Tech, MICHAEL KAVIC, Long Island University — Astrophysical phenomena such as exploding primordial black holes (PBHs), gamma-ray bursts (GRBs), compact object mergers, and supernovae are expected to produce a single pulse of electromagnetic radiation detectable in the low-frequency end of the radio spectrum. Detection of any of these pulses would be significant for the study of the objects themselves, their host environments, and the interstellar/intergalactic medium. Furthermore, a positive detection of an exploding PBH could be a signature of an extra spatial dimension, which would drastically alter our perception of spacetime. However, even upper limits on the existence of PBHs, from searches, would be important to discussions of cosmology. We describe a method to carry out an agnostic single dispersed pulse search, and apply it to data collected with ETA. Applying the single pulse search procedure to 30 hours worth ETA data yielded no compelling detections with $S/N \geq 6$. However, with ≈ 8 hours of interference free data, we find an observational upper limit to the rate of exploding PBHs $r \approx 8 \times 10^{-8}\,\mathrm{pc}^{-3}\,\mathrm{y}^{-1}$ for a PBH with a fireball Lorentz factor $\gamma_f = 10^{4.3}$.

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