Abstract Submitted
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Search for Axion topological defects using the Global Network of Optical Magnetometers for Exotic physics (GNOME)[1] HECTOR MASIA ROIG, JOSEPH A. SMIGA, Helmholtz Institut Mainz, Johannes Gutenberg-Universitaet, 55099 Mainz, Germany, GNOME COLLABORATION — The Global Network of Optical Magnetometers for Exotic physics (GNOME) is a network of geographically separated, time-synchronized atomic magnetometers and comagnetometers in magnetically shielded environments. This configuration allows monitoring the energy splitting of Zeemann sublevels in an atomic ensemble continuously and simultaneously at different places all over the Earth. Axion-like particles could form topological defects that couple to atomic spins. Such an interaction would alter the Zeeman sublevel energy splitting producing a transient signal in the magnetometer network. The Earths movement is used to probe different regions of the galaxy for such defects. Possible candidates for the topological defects are domain walls which would be observed as an event plane crossing the earth following a predictable signal pattern. A time-domain analysis method was developed to look for correlations between the different magnetometers compatible with an axion domain-wall[2] . These methods are applied to the data gathered by GNOME in order to identify possible axion domain-wall events. [2] H.Masia-Roig, J. A. Smiga et al., arXiv:1912.0872

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