Gravitational Waves from Dark Bubbles in the Early Universe

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We will discuss dark matter models related to dark first order phase transitions (D.F.O.P.T.) in the early Universe. D.F.O.P.T. source efficiently trigger bubbles enucleation. Dark bubbles can then scatter producing a gravitational radiation background that can be detected in the next generation of experiments for the detection of gravitational waves. We will discuss the specific framework of the Majoron dark matter, endowed with a massive neutrino and a Warm Dark Matter genesis model. Majorons may also be detected in next laboratory experiments, including: i) electron-positron high luminosity colliders; ii) neutrino-less-double-beta decays processes; iii) experiments searching for baryon violating Neutron-Antineutron transitions.