Contribution ID: **11** Type: **not specified**

ELÍAS CASTELLANOS: Bose-Einstein condensates as dark matter halos

Wednesday, 19 February 2020 16:30 (30 minutes)

Scalar Fields in the form of Bose-Einstein condensates (BEC's), seem to be a good candidate to describe dark matter in the universe. Even more, the existence of black holes in the center of some galaxies could be astrophysical phenomena that lead to the so-called quasi-bound states for the condensate that, in this scenario, can be interpreted as a galactic dark matter halo. By using the Thomas-Fermi approximation, we analyze the density distribution of the condensate in a Schwarzschild black hole space time, which we assumed as the BEC-dark matter halo. Additionally, from a simple and concise form we are able to confront the predictions of the Tomas-Fermi approximation with some data of rotation curves in galaxies. We set constraints on the parameters related to the halo, i.e., the mass parameter, the self-interaction coupling constant and the mass of the black hole (the only astrophysical parameter). We found that we could have a good fitting to the galaxies rotation curve, making to the Bose-Einstein condensate model a strong candidate to explain the fundamental nature of dark matter.

Session Classification: SHORT TALKS

Track Classification: SYMPOSIUM ON BLACK HOLES AND GRAVITATIONAL WAVES