Contribution ID: **308**   Type: **Poster**

Quasi-Degenerate Vacua in the KSVZ axion model; A minimal approach to dark energy and dark matter.

We present a study of the KSVZ axion model with quasi-degenerate vacua as a minimal model for dark energy and dark matter. We demonstrate that the combination of the classical two-field potential for the Higgs and the PQ scalar, and quantum corrections, allows the existence of degenerate minima and of inflection points. We propose an explanation for dark energy in the form of the difference in the energy density of the electroweak vacuum and a second quasi-degenerate minimum in the effective potential. We show that the lower bound on the axion decay constant which permits quasi-degenerate minima, $f_a = 2.39 \times 10^{10}$ GeV, is consistent with the most recent dark matter estimate, $f_a = (2.27 \pm 0.33) \times 10^{11}$ GeV, and predicts a lower bound on the fraction of dark matter due to axions. We also discuss the applications of our study to electroweak vacuum stability and to the generation of inflection points.

Primary author: Mrs LLOYD-STUBBS, Amy (Lancaster University)

Session Classification: Parallel Sessions: Modified Gravity and Dark Energy (C.A.R.L., H03)

Track Classification: Modified Gravity and Dark Energy