

# **FUV-IR correlation and study of diffuse Far Ultraviolet emission from Holmberg II: An *AstroSat* view**

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The main source of diffuse Far Ultraviolet (FUV) emission in galaxies is the scattering of starlight by the interstellar dust grains. Dust also absorbs shorter wavelength photons (UV, optical) and re-emits in the longer wavelengths, mainly in the Mid-Infrared (MIR) and Far-Infrared (FIR) resulting in diffuse Infrared (IR) emission. These two processes of scattering and absorption are complementary and are likely to result in FUV-IR correlations. In this work, we use the FUV observations of the dwarf irregular galaxy Holmberg II, obtained with the UltraViolet Imaging Telescope (UVIT) onboard *AstroSat*, India's first multi wavelength space mission. With a spatial resolution of 1.2''-1.6'', this is the most resolved FUV observation of the galaxy till date, at a wavelength of 154 nm. We extract diffuse FUV intensities from 50 different regions throughout the galaxy and complement these with IR observations of the same regions obtained with the Spitzer Space Telescope in 7 different IR bands in order to study the FUV-IR correlations. This enables us to determine the nature of the dust grains contributing to the diffuse emission. We further model the diffuse FUV emission for some selected regions with a 3D radiative transfer model to derive the dust geometry as well as scattering properties of the dust grains, like single scattering albedo and asymmetry factor, in the galaxy. We also try to extract the point sources and determine the fraction of diffuse emission in the galaxy.