

A STUDY OF A PULSAR PUMPED CAVITY AT LONGITUDE +36°

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Abstract:

Pulsars are compact objects and are the signatures of early universe, formed in evolutionary sequence of stars. These are radio source as they emit radio frequency and observed pulses are due to misalignment of rotational and magnetic axis of pulsar which are useful probes of the gravitational environment in which they are found. A systematic search of cavity like structure formed by pulsar in the far infrared (100 μ m and 60 μ m) IRAS (Infrared Astronomical Satellite) survey was performed using Sky View Virtual Observatory. In order to find the possible isolated cavity like structure not yet studied, we used SIMBAD database to locate discrete sources in the region. A cavity like structure (size about 3.9 pc to 2.5 pc) was found around the coordinate of R.A. (J2000) 20^h38^m12^s and Dec (J2000) 36°19'25" at distance of about 450 pc. In this present work we have studied the flux density and temperature variation within structure. We found that variation of temperature from 20.8K to 28.8K within offset of 8K (greater than 5K) suggesting that the cavity is either very dip or might be formed due to various processes such as interstellar bubble formation, dust and grain formation, etc. The mass profile of each pixel of the region of interest was calculated with the help of this temperature. For the calculation of excess mass, we drew two circles such that the major axis as one diameter and minor axis as other and mass deficit per pixel in inner circle was found to be 1.1×10^{26} Kg. We also calculated the energy of pulsar required to create that inhomogeneity in the structure. The energy of the pulsar is calculated to be 2.2×10^{40} Joule.