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DETECTION OF NEUTRINOS FROM MICRO-QUASARS I

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Using the neutrino intensity obtained from models for high-energy particle-emission from low-mass micro-quasars, we calculate the neutrino flux with and without including neutrino oscillations. We show that the neutrino flux from a micro-quasar is affected by neutrino oscillations. The effect reflects upon the increase in the time of observation, for km-scale neutrino detector.

Keywords: Cosmic says; astronomical observations; quasars; neutrino oscillation.

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1. Introduction

Binary systems formed by a star that feeds a compact object, and where part of the donated matter is ejected as two collimated jets, are called micro-quasars. These systems are capable of accelerating particles to very high energy[1] and they are a source of high energy neutrinos. The hadronic and leptonic contributions produced in these systems have been studied by several authors.[2–6] Particularly, the authors of Ref. 2 have studied the effects caused by the presence of strong magnetic fields on the spectra of secondary particles produced in the jets. They have started their calculations by computing the proton energy distribution, considering the energy losses, and the interaction between relativistic protons with the magnetic field. Afterward, they have obtained the pion- and muon-energy distributions needed to calculate the neutrino-injection and the neutrino flux emitted in the decay of those particles.