

Search for gamma-ray emission from interstellar visitors 1I/'Oumuamua and 2I/Borisov with Fermi-LAT data

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The asteroid 1I/'Oumuamua (A/2017 U1) and the cometary-like object 2I/Borisov (C/2019 Q4) are the first two objects of interstellar origin discovered in our Solar system. They approached the Earth in October 2017 and in December 2019 respectively.

We searched for gamma-ray emission with the Fermi Large Area Telescope (LAT) data for energies above 56 MeV, focusing on the period before and after the minimum distance from the Earth. Such gamma-ray emission could originate from the interaction of cosmic rays (CRs) with their surfaces or from more exotic gamma-ray production due to accelerated particles or dark matter annihilation.

We analyzed the data with two independent methods, based on a maximum likelihood analysis with different methods for background estimation. No significant signal was found and upper limits on the gamma-ray flux were derived. A physical model based on CR interaction was also applied, providing information on the physical size of the two objects.

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