

New flux limit in the low relativistic regime for magnetic monopoles at IceCube

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Magnetic monopoles are hypothetical particles that carry magnetic charge. Depending on their velocity, different light production mechanisms exist to facilitate detection. In this work, a previously unused light production mechanism, luminescence of ice, is introduced. This light production mechanism is nearly independent of the velocity of the incident magnetic monopole and becomes the only viable light production mechanism in the low relativistic regime (0.1-0.55c). An analysis in the low relativistic regime searching for magnetic monopoles in seven years of IceCube data is presented. While no magnetic monopole detection can be claimed, a new flux limit in the low relativistic regime is presented, superseding the previous best flux limit by 2 orders of magnitude.

Keywords

Magnetic; Monopole; luminescence; IceCube; limit;

Collaboration

IceCube

other Collaboration

Subcategory

Experimental Results

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