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Symmetry fractionalization of visons in Z_2 spin liquids YANG QI, Perimeter Institute for Theoretical Physics, MENG CHENG, Station Q, Microsoft Research, CHEN FANG, Massachusetts Institute of Technology — In this work we study symmetry fractionalization of vison excitations in topological Z_2 spin liquids. We show that in the presence of the full $SO(3)$ spin-rotational symmetry and if there is an odd number of spin- $\frac{1}{2}$ per unit cell, the symmetry fractionalization of visons is completely fixed. On the other hand, visons can have different classes of symmetry fractionalization if the spin-rotational symmetry is reduced. As a concrete example, we show that visons in the Balents-Fisher-Girvin Z_2 spin liquid have crystal symmetry fractionalization classes which are not allowed in $SO(3)$ symmetric spin liquids, due to the reduced spin-rotational symmetry.

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