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Double antisymmetry in magnetic structures

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This work follows from the recent introduction of the rotation-reversal operation intended to be analogous to the time-reversal operation used to describe the symmetry of magnetic structures. As a second independent antisymmetry operation, this operation "doubles" the antisymmetry of the magnetic space groups, hence the term double antisymmetry. Supposing the consideration of both rotation-reversal and time-reversal symmetry, it was found that there are 17,803 types of symmetry that a crystal could exhibit; the 1,651 magnetic space group types being a subset of these, just as the 230 crystallographic space group types are a subset of the magnetic space group types. In addition to discussing the methods applied to determine these types, describing their properties, and listing their symmetry diagrams (available online), the implications for symmetry constraints in magnetic structure determination will be explored.