TABLE IV: The symmetry of the different configurations, treating the arrows as polar vectors, or as axial vectors with and without inclusion of the time reversal symmetry. In the last column we show the broken symmetry (we assume no magnetic field in the case of the 2:2 collinear state and magnetic field along the z direction for 3:1 collinear and for the two canted states). The notation is the same as in the Table III, with the addition of two elements: σ_v is a reflection to a plane perpendicular to the C_∞ axis (σ_{xz} is also a σ_v), while C_2' is a two–fold rotation with axis perpendicular to the C_∞ axis.

state	polar vectors	axial vectors	spins (axial vectors + time reversal)	symmetry broken
2:2 collinear	$D_{\infty h} = C_\infty \otimes \{1, C_2', \sigma_v, I\}$	$D_{\infty h}$	$D_{\infty h} + \Theta D_{\infty h}$	$O(3)/(O(2) \times O(1)) = \mathbb{R}\mathbf{P}^2$
3:1 collinear	$C_{\infty v} = C_\infty \times \{E, \sigma_v\}$	$C_\infty \times \{E, I\}$	$C_\infty \times \{E, I\} + \Theta\sigma_v C_\infty \times \{E, I\}$	1
2:2 canted	$C_{2v} = \{E, C_2(z), \sigma_{xz}, \sigma_{yz}\}$	$C_{2h} = \{E, I, C_2(z), \sigma_{xy}\}$	$C_{2h} + \Theta\sigma_{xz} C_{2h}$	C_∞/C_2
3:1 canted	$C_{1h} = \{E, \sigma_{xz}\}$	$S_2 = \{E, I\}$	$S_2 + \Theta\sigma_{xz} S_2$	C_∞