

Supplementary Materials: Multiple Magnetization Reversal Channels Observed in a 3d-4f Single Molecule Magnet

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Table S1. Agreement factors of the Dy coordination polyhedron in DyCo with different ideal eight-coordination polyhedra, as obtained by SHAPE.

HPY-8	HBPY-8	CU-8	SAPR-8	TDD-8	JGBF-8	JETBPY-8	JBTPR-8	BTPR-8	JSD-8	TT-8	ETBPY-8
23.647	16.068	10.189	0.829	1.363	15.135	29.320	2.012	1.302	4.094	10.978	24.782

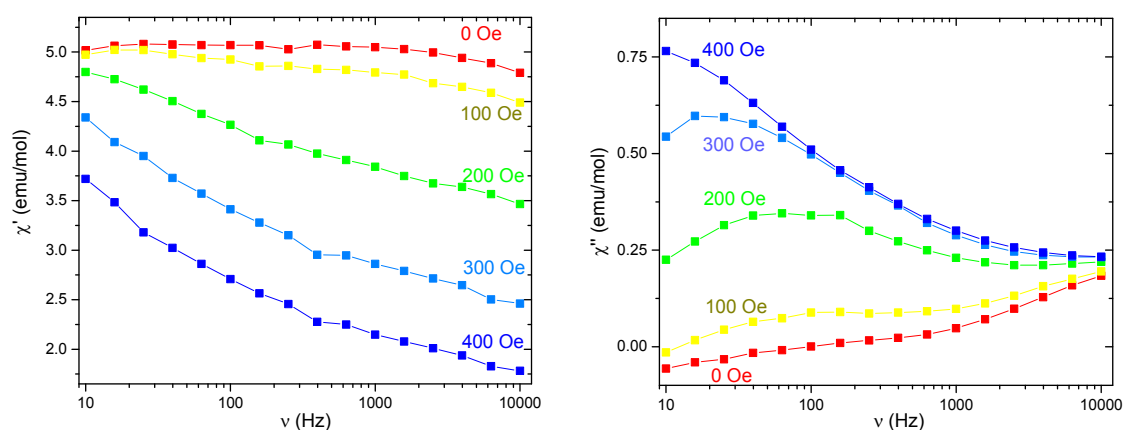


Figure S1. High Frequency dependent in and out-of-phase (χ' , χ'') components of AC susceptibility of DyCo measured at 2 K. The solid lines are guides for eyes.

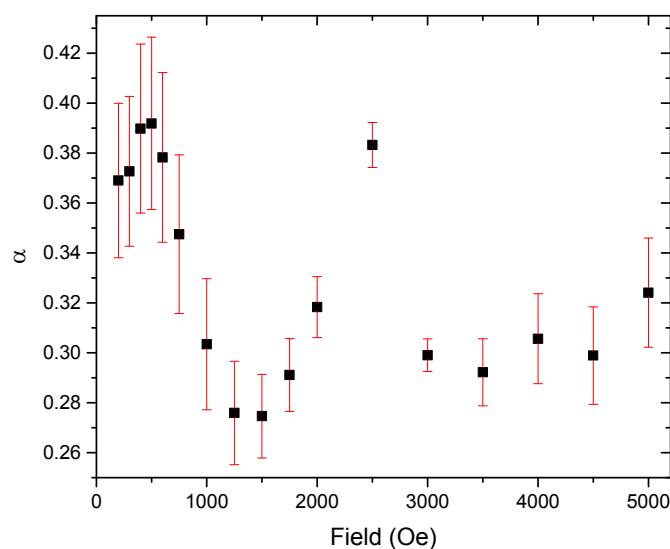


Figure S2. Behavior of the α parameter as a function of the applied static magnetic field obtained by the Debye fits of $\chi''(\nu)$ at 2 K.

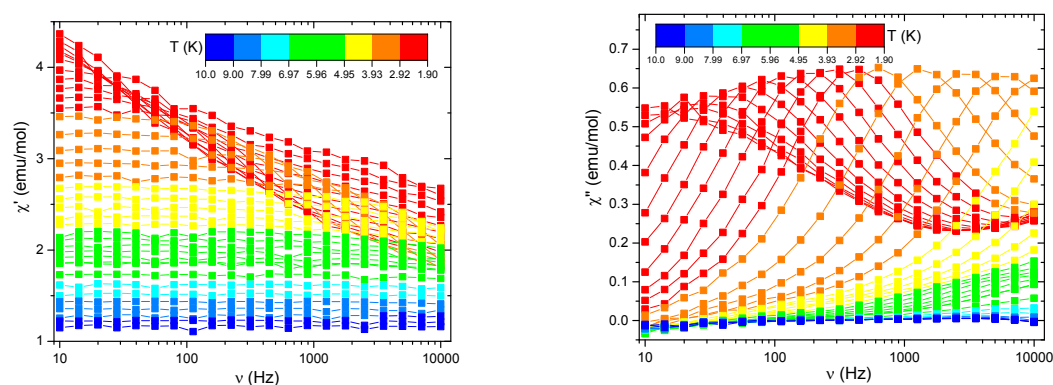


Figure S3. Frequency dependence of the in- and out-of-phase (χ' , χ'') susceptibility of **DyCo** measured at 300 Oe, as a function of variable temperature. The lines are guides for eyes.

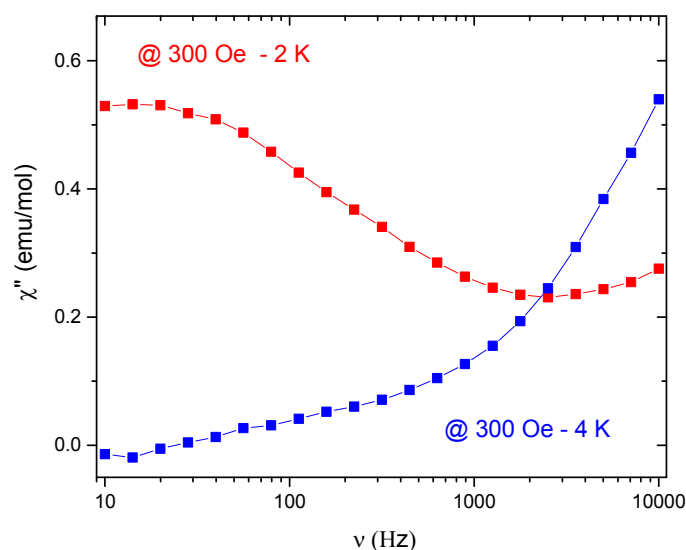


Figure S4. Identification of multiple maxima in the out of phase susceptibility of **DyCo** observed at 300 Oe at 2 and 4 K respectively.

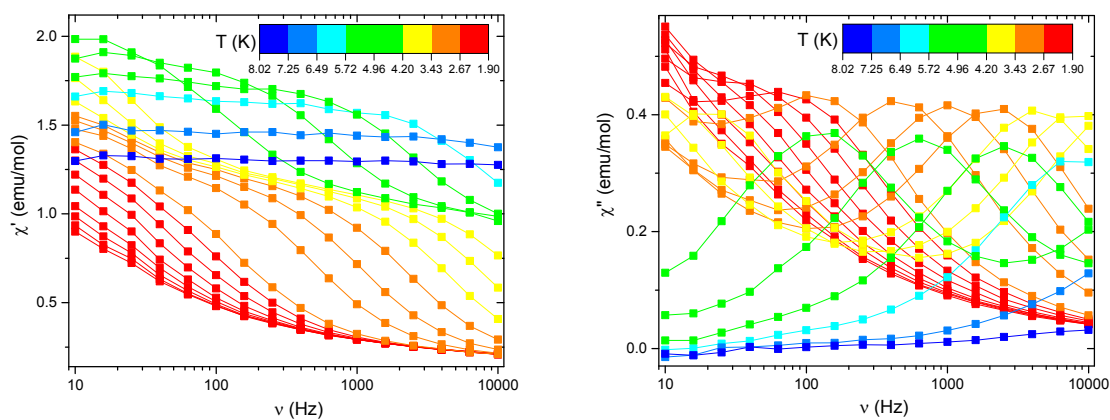


Figure S5. Frequency dependence of the in and out-of-phase (χ' , χ'') susceptibility of the complex measured at 2 KOe, as function of variable temperature. The lines are guides for eyes.

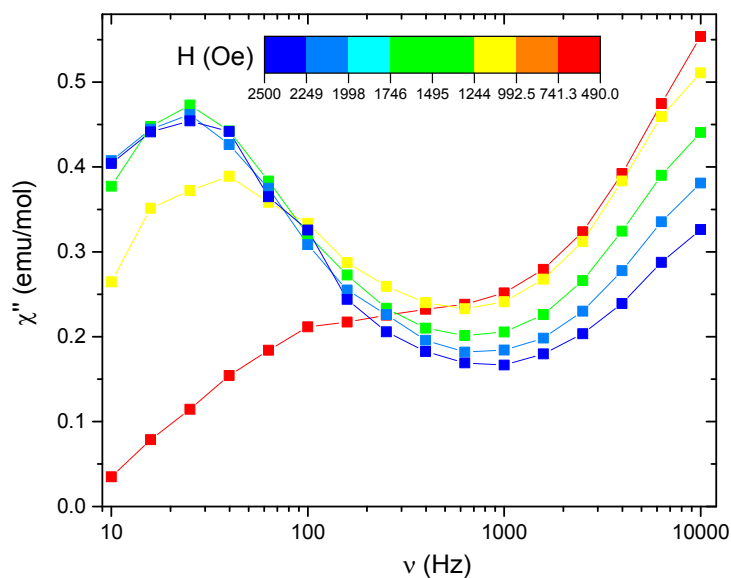


Figure S6. Frequency dependence of the out-of-phase component of the imaginary component of the molar AC susceptibility of **DyCo** measured at 4 K at variable external static magnetic field in the high frequency regime. The solid lines guides for the eyes.

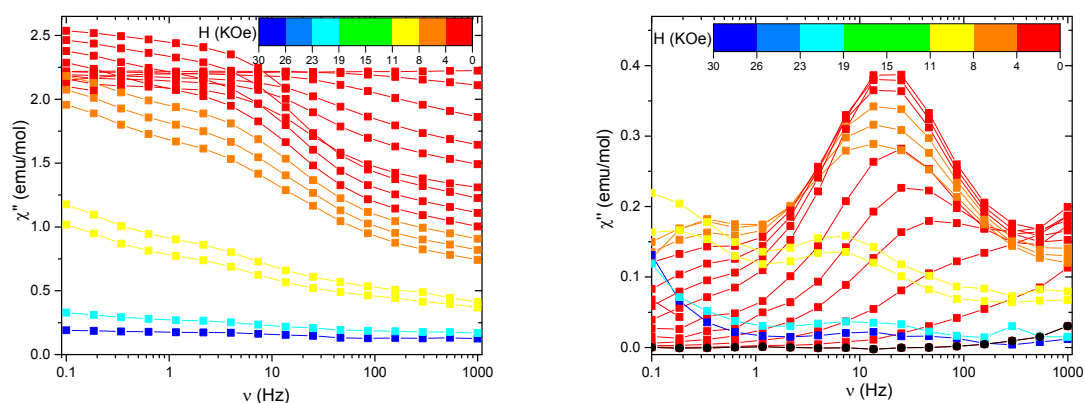


Figure S7. Frequency dependence of the in and out-of-phase component of the molar AC susceptibility of **DyCo** measured at 4 K at variable external static magnetic field. The solid lines are guides for the eyes; data in black are obtained at 0 Oe.

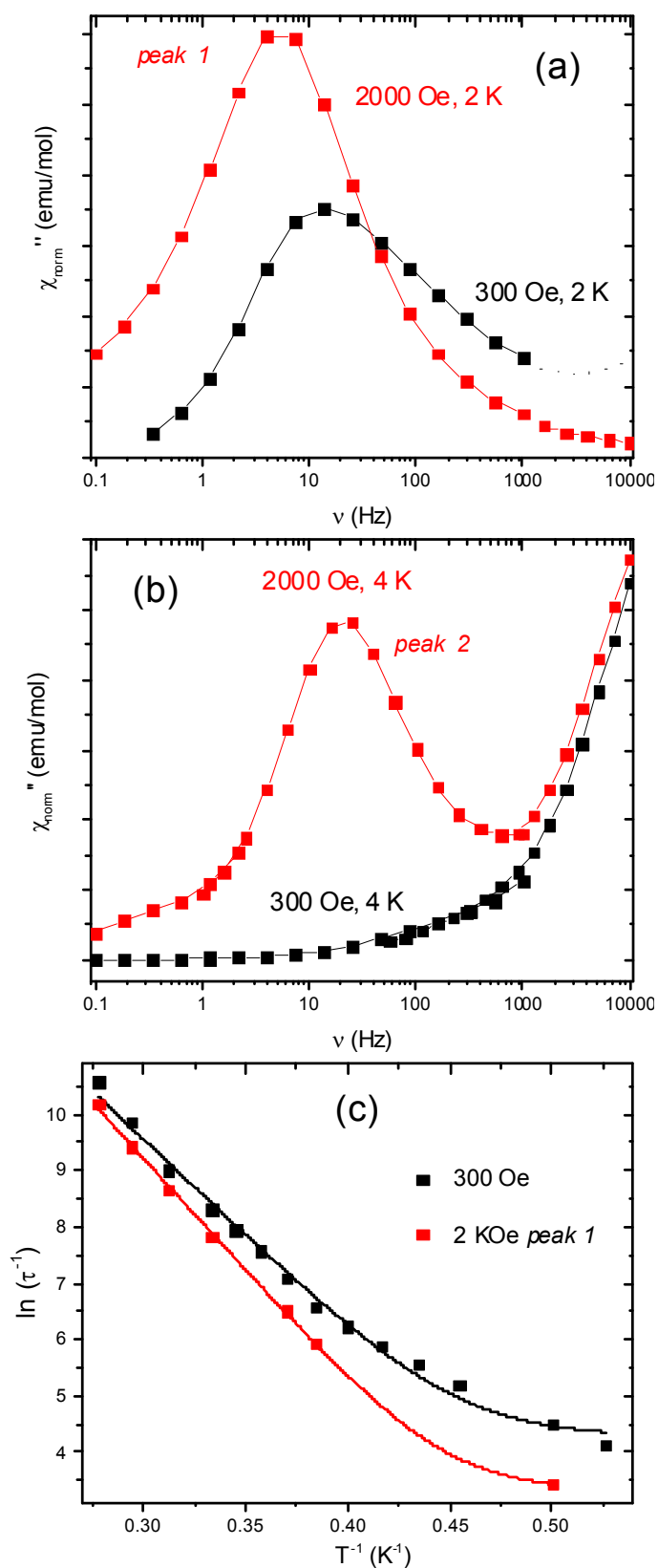


Figure S8. (a) Field dependent behavior of peak 1 observed at 2 K; (b) Field dependent behavior of peak 2 observed at 4 K. The y -axis is normalized to clearly display the peaks and their respective behaviors. The solid lines in **a** and **b** are guide for eyes; (c) Behavior of the relaxation times as function of temperature for 0.3 and 2 KOe. The solid lines are fits, as explained in the main draft.

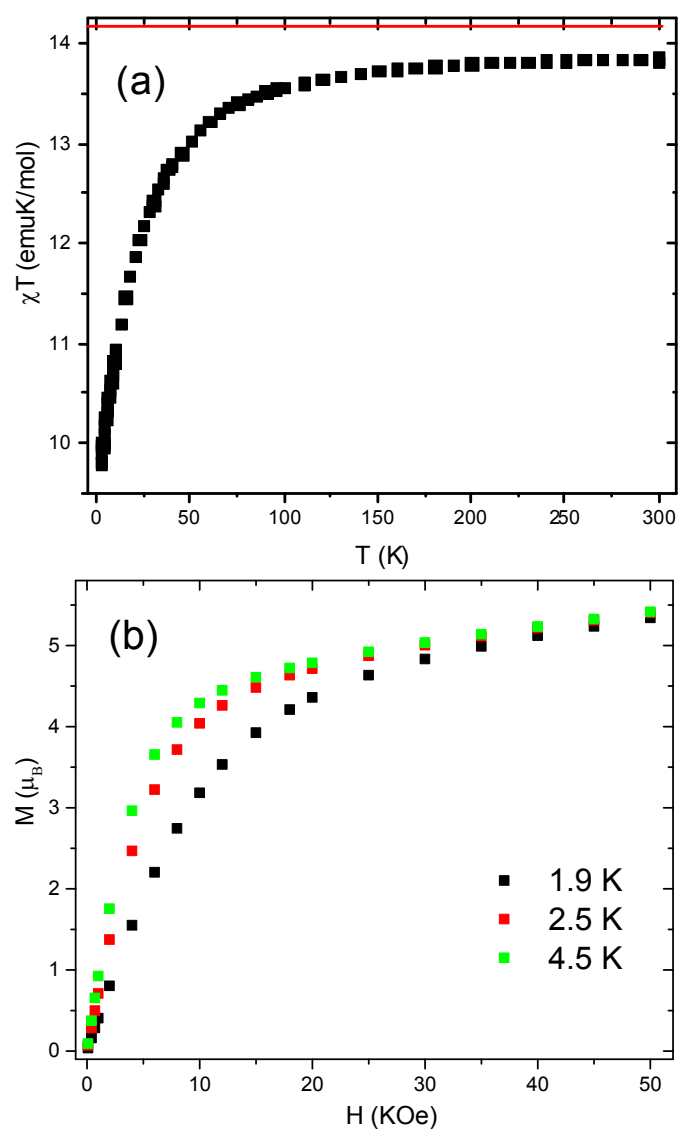


Figure S9. Dc magnetic characterization (a) Temperature dependence of the χT product for the polycrystalline DyCo sample. The red line indicates the free ion χT value expected for a single Dy^{III} ; (b) Isothermal Magnetization as a function of magnetic field at different temperatures.

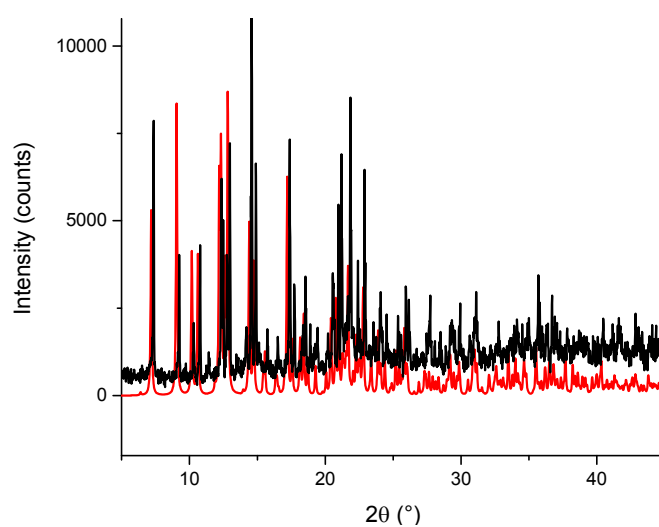


Figure S10. Experimental powder X-ray diffraction spectra of DyCo compared to the theoretical one expected on the basis of the molecular structure obtained by single crystal X-ray diffraction.