Title:	Emergence of weak pyrochlore phase and signature of field induced spin ice ground state in Dy2-xLaxZr2O7; X = 0, 0.15, 0.3
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Abstract:	The pyrochlore oxides Dy2Ti2O7 and Ho2Ti2O7 are well studied spin ice systems and have shown the evidences of magnetic monopole excitations. Unlike these, Dy2Zr2O7 is reported to crystallize in a distorted fluorite structure. We present here the magnetic and heat capacity studies of La substituted Dy2Zr2O7. Our findings suggest the absence of spin ice state in Dy2Zr2O7 but the emergence of the magnetic field induced spin freezing near T ≈ 10 K in ac susceptibility measurements which is similar to Dy2Ti2O7. The magnetic heat capacity of Dy2Zr2O7 shows a shift in the peak position from 1.2 K in zero field to higher temperatures in the magnetic field, with the corresponding decrease in the magnetic entropy. The low temperature magnetic entropy at 5 kOe field is R ln2 - (1/2)R ln(3/2) which is the same as for the spin ice state. Substitution of non-magnetic, isovalent La3+ for Dy3+ gradually induces the structural change from highly disordered fluorite to weakly ordered pyrochlore phase. The La3+ substituted compounds with less distorted pyrochlore phase show the spin freezing at lower field which strengthens further on the application of magnetic field. Our results suggest that the spin ice state can be stabilized in Dy2Zr2O7 either by slowing down of the spin dynamics or by strengthening the pyrochlore phase by suitable substitution in the system
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