

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Magnetic-field-induced quantum criticality in a spin-1 planar ferromagnet with single-ion anisotropy** MARIA TERESA MERCALDO, ILEANA RABUFFO, LUIGI DECESARE, Università di Salerno, ALVARO CARAMICOD'AURIA, Università di Napoli — The effects of single-ion anisotropy on field-induced quantum criticality in spin-1 planar ferromagnet is explored by means of the two-time Green's function method. We work at the Tyablikov decoupling level for exchange interactions and the Anderson-Callen decoupling level for single-ion anisotropy. In our analysis a longitudinal external magnetic field is used as the non-thermal control parameter and the phase diagram and the quantum critical properties are established for suitable values of the single-ion anisotropy parameter. We find that the single-ion anisotropy has sensible effects on the structure of the phase diagram close to the quantum critical point. Indeed, for values of the uniaxial crystal-field parameter above a positive threshold a re-entrant behavior appears for the critical line, while above this value the conventional magnetic-field-induced quantum critical scenario remains unchanged.

M. T. Mercaldo, I. Rabuffo, L. De Cesare, A. Caramico D'Auria, Eur. Phys. J. B **86**, 340 (2013)

Maria Mercaldo  
Univ of Salerno

Date submitted: 14 Nov 2013

Electronic form version 1.4