

Abstract Submitted  
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**Possible Correlation-Enhanced Magnetic Ordering at Anomally High Temperatures in Dy under Extreme Compression**<sup>1</sup> JINHYUK LIM, Washington University in St. Louis, GILBERTO FABBRIS, Argonne National Lab/Washington University in St. Louis, DANIEL HASKEL, Argonne National Lab, JAMES SCHILLING, Washington University in St. Louis — Most lanthanides order magnetically at temperatures  $T_o$  well below ambient, the highest being 292 K for Gd. The highly localized magnetic state of the heavy lanthanides should become unstable at sufficiently high pressure, leading to a competition between the RKKY interaction and Kondo physics. Most lanthanides undergo a volume collapse at a critical pressure  $P_{vc}$ , the largest being 16% in Ce at only 0.7 GPa but 6% in Dy at 73 GPa, possibly a sign that the magnetic state has become unstable. Recent electrical resistivity measurements on Dy reveal a highly non-monotonic dependence of  $T_o$  on pressure. Immediately above  $P_{vc}$ ,  $T_o(P)$  in Dy shows a dramatic increase, extrapolating to values near 400 K at 160 GPa (1.6 Mbar). Interestingly, the pressure dependence of the magnetic spin-disorder resistivity  $\rho_{sd}(P)$  tracks that of  $T_o(P)$ . The results of parallel experiments on Gd and further heavy lanthanides will also be presented.

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