

Abstract Submitted
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Simultaneous occurrence of multiferroism and short-range magnetic order in DyFeO₃¹ JINCHEN WANG, JUANJUAN LIU, JIEMING SHENG, WEI LUO, Renmin Univ of China, FENG YE, Oak Ridge National Laboratory, ZHIYING ZHAO, XUEFENG SUN, University of Science and Technology of China, SERGEY DANILKIN, GUOCHU DENG, The Bragg Institute, Australian Nuclear Science and Technology Organisation, WEI BAO, Renmin Univ of China — We report a combined neutron scattering and magnetization study on the multiferroic DyFeO₃, which shows a very strong magnetoelectric effect. Applying magnetic field along the *c* axis, the weak ferromagnetic order of the Fe ions is quickly recovered from a spin reorientation transition, and the long-range antiferromagnetic order of Dy becomes a short-range one. We found that the short-range order concurs with the multiferroic phase and is responsible for its sizable hysteresis. Our *H* – *T* phase diagram suggests that the strong magnetoelectric effect in DyFeO₃ has to be understood with not only the weak ferromagnetism of Fe but also the short-range antiferromagnetic order of Dy.

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