

Abstract Submitted
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Neutron diffraction study on the phase diagram in multiferroic DyFeO₃ JINCHEN WANG, JUANJUAN LIU, JIEMING SHENG, Renmin Univ of China, ZHIYING ZHAO, XIA ZHAO, XUEFENG SUN, University of Science and Technology of China, SERGEY DANILKIN, Australian Nuclear Science and Technology Organisation, WEI BAO, Renmin Univ of China — The discovery of the multiferroic effect in perovskite DyFeO₃ has generated many interests due to a witnessed strong magnetoelectric coupling. In this low temperature and high magnetic-field single-crystal neutron diffraction study, we determined the magnetic phase-diagram of DyFeO₃. Although the weak ferromagnetic phase of Fe spins has been suggested to be instrumental to the strong multiferroic effect in current experimental and theoretical works, the multiferroic effect is observed only in the phase area where the applied magnetic field breaks the long-range ordered (LRO) AF order of the Dy ions into a short-range order (SRO). Our results suggest the mechanism of the remarkably strong multiferroic effect in the prototype rare-earth orthoferrite DyFeO₃ ought to be investigated through the interplay between the weak ferromagnetism of Fe and the antiferromagnetic SRO of Dy spins.

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