Magnetic-field-induced polarization in the square-lattice antiferromagnetic $\text{Ba}_2\text{CoGe}_2\text{O}_7$ HEE TAEK YI, YOUNG JAI CHOI, SEONGSU LEE, SANG-WOOK CHEONG, Rutgers University — We have discovered the appearance of ferroelectricity below the Neel temperature of 6.7 K in the square-lattice antiferromagnetic $\text{Ba}_2\text{CoGe}_2\text{O}_7$ single crystal, grown by using a floating zone technique. The ferroelectric polarization aligns along the tetragonal $c$ axis, but is very small in magnitude. However, the magnitude of polarization increases remarkably and the polarization direction smoothly rotates away from the $c$ axis with increasing magnetic fields along the $c$ axis. This change of polarization and the associated change of dielectric constant with fields are monotonic without going through any phase transition.

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