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The First Successful Use of Multiple Lines of Sight to Measure Faraday Rotation Through a Coronal Mass Ejection MADISON ASCIONE, Georgetown University, JASON KOOI, U.S. Naval Research Laboratory, LIANIS REYES-ROSA, Fayetteville State University, SOPHIA RIER, Bishop Ireton High School, MOHAMMAD ASHAS, California State University at Long Beach — Coronal mass ejections (CMEs) are large eruptions of magnetized plasma that are ejected from the Sun. CMEs produce energetic particles and enhance terrestrial current systems that can create geomagnetic storms on Earth, cause major grid blackouts, and disrupt satellite signals. Understand CMEs is important in order to better forecast space weather, allowing ample time to prepare in the event a large CME is projected to hit Earth. One method proven successful in determining the strength and structure of the coronal magnetic field and physics of CMEs is Faraday rotation (FR), which is the rotation of the plane of polarization when linearly polarized radiation propagates through a magnetized plasma. Previous observations of CME FR have all been limited to a single line of sight (LOS) whereas we report the first successful observations of FR through a CME using *multiple* LOS: 13 LOS across seven target radio fields. These observations were made on 31 July, 2015 using the *Karl G. Jansky Very Large Array* (VLA) at 1-2 GHz frequencies using a constellation of radio sources at heliocentric distances of 8.2-19.5 solar radii, and are the first *triggered* VLA observations of CME FR. The advantage of multiple LOS is that we can determine the CME's magnetic field strength and orientation.

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