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Magnetic field effects on gravitational waves from binary neutron stars MATTHEW ANDERSON, ERIC HIRSCHMANN, Brigham Young University, LUIS LEHNER, Louisiana State University, STEVEN LIEBLING, Long Island University, PATRICK MOTL, Louisiana State University, DAVID NEILSEN, Brigham Young University, CARLOS PALENZUELA, Albert Einstein Institute, JOEL TOHLINE, Louisiana State University — Observational evidence indicates that a fair number of neutron star binaries and neutron star-black hole binaries have a sizable magnetic field which can be responsible for powering pulsars and colimating jets. Magnetic field effects additionally can have a strong influence on the dynamics of the fluid by redistributing angular momentum through different mechanisms (magnetic winding and braking, magneto-rotational instabilities) depending on the strength of the magnetic field and the typical time scales involved in the process. These processes can affect the multipolar structure of the source and consequently the produced gravitational wave. We present results of neutron star binary mergers both with and without magnetic field and discuss the magnetic effects on the gravitational waves, fluid structure, and merger timescale.

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