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Rainich geometrization extended to electromagnetic fields in (2 + 1)-dimensional gravity. DIONISIOS KRONGOS, CHARLES TORRE, Utah State University — In four spacetime dimensions the Rainich conditions are a set of equations equivalent to the Einstein-Maxwell equations, but are expressed solely in terms of the metric tensor. We have found the analogous conditions in (2 + 1)-dimensional gravity such that a metric tensor defines a non-null solution to the Einstein-Maxwell equations. These conditions can be extended to other theories of (2 + 1)-dimensional gravity. These conditions are obtained by reducing the problem to that of a scalar field, which we have treated elsewhere. We illustrate these results using the charged BTZ solution.

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