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Inverse potential problems in divergence form on surfaces: non-uniqueness

We consider fields of Newtonian potentials whose defining measure is the divergence of a distribution supported on a surface, the latter being at least Lipschitz smooth. This framework appears in inverse magnetization problems and, more generally, inverse problems arising from Maxwell's equations in the quasi-static approximation. We describe magnetizations which generate the zero field on one side of the surface, in terms of a spectral integral equation. A technical role is played by a Hardy-Hodge decomposition for vector fields, which is new.