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Composition calculus in inverse scattering

Fourier integral operators (FIOs) with singularities are used in inverse scattering theory. In such problems, artifacts can appear when inversion is attempted and one would like to understand precisely and eliminate them as far as possible. The operators considered here arise in linearized seismic imaging and synthetic aperture radar. The singularities which appear in this problems are folds, submersion with folds and cross caps. One would like to understand the composition of such operators since in general, the composition of two FIOs is not a FIO. We will establish a composition calculus for FIOs associated to folding canonical relations, working away from the fold points.