On the range characterization of the Radon transform in two dimensions. Preliminary report.

Range characterization of the Radon transform has been known since the early 1960s in the works of Gelfand-Graev, Ludwig, and Helgason (the so called Cavalieri conditions). For Riemannian geometries, the range characterization has been provided in terms of the scattering relations by Pestov-Uhlmann in 2004. The equivalence between the two characterization was recently shown by Monard 2018. A separate characterization has been given by the authors in 2014 in terms of a Hilbert transform corresponding to the A-analytic maps in the sense of Bukhgeim (introduced in 1995). In this talk I will present some recent results establishing the equivalence between the Hilbert transform characterization and the Cavalieri conditions. (Received September 16, 2019)