A uniform reconstruction formula in integral geometry

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We address the problem of reconstruction of a function on a manifold from data of its integrals over a family of hypersurfaces. The archetypes are reconstruction of a function on a sphere from data of big circle integrals (Minkowski-Funk) and of a function in plane from data of line integrals (Radon). A general integral formula will be presented that covers all known cases where such an explicit reconstruction is known and also several unknown cases. Possibility of the uniform reconstruction method depends on vanishing of some singular integrals over a sphere.