## Structure of the Semi Classical Scattering Matrix for General Scattering Relations

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We will show that the scattering amplitude for short range potential perturbations of the Laplacian, when restricted away from the diagonal in  $\mathbb{S}^{n-1} \times \mathbb{S}^{n-1}$ , quantizes the natural scattering relation in the sense of semi-classical Fourier integral operators. In the case of a compactly supported perturbation the result holds near the diagonal in  $\mathbb{S}^{n-1} \times \mathbb{S}^{n-1}$  as well. We will then show how, under a certain geometric assumption, this implies an oscillatory integral representation of the scattering amplitude the phase in which is given by the (modified) action.