1023-35-977 **Plamen Stefanov*** (`stefanov@math.purdue.edu`), West Lafayette, IN 47907. *Tensor Tomography and Boundary and Lens Rigidity of Riemannian manifolds.* Preliminary report.

Let (M, g) be a compact Riemannian manifold with boundary. We study the geodesic ray transform I_Γ of tensor fields over geodesics in an open subset Γ for a class of metrics g that may have conjugate points. Some non-conjugacy assumptions are still imposed. Under the assumptions that $N^*\Gamma$ covers T^*M, and some topological conditions, we show that I_Γ is injective on solenoidal tensors for generic metrics in this class, including the real analytic ones. We also prove a stability estimate and discuss applications to the non-linear boundary and lens rigidity problems. All results are obtained jointly with Gunther Uhlmann. (Received September 24, 2006)