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(david.sher@mail.mcgill.ca). *Heat invariants of the Steklov eigenvalue problem*. Preliminary report.

We study the heat invariants associated to the Steklov eigenvalue problem on a Riemannian manifold with boundary. Using the Seeley calculus, we prove a general structure theorem for these invariants. We also compute the first few heat invariants explicitly, which identifies several new Steklov spectral invariants. In particular, we prove that the total mean curvature is a Steklov spectral invariant whenever the dimension of the manifold is at least 3. As an application, we prove global Steklov spectral rigidity for a ball in  $\mathbb{R}^3$ : if a compact domain in  $\mathbb{R}^3$  with simply connected boundary has the same Steklov spectrum as a ball, then it is a ball. This is joint work with I. Polterovich (Université de Montréal). (Received February 04, 2013)