1067-92-187 **Eric Todd Quinto*** (todd.quinto@tufts.edu), Tufts University, Department of Mathematics, 503 Boston Ave., Medford, MA 02155, **Andreas Rieder** (andreas.rieder@kit.edu), Karlsruhe Institute of Technology, Kaiserstrasse 93, D-76133 Karlsruhe, Germany, and **Thomas Schuster** (schuster@hsu-hh.de), Helmut Schmidt Universitaet, Fachbereich Maschinenbau, Holstenhofweg 85, D-22043 Hamburg, Germany. *Local Inversion of the Sonar Transform Regularized by the Approximate Inverse.*

A new reconstruction method is given for the spherical mean transform with centers on a plane in $\mathbb{R}^3$ which is also called the Sonar transform. The data are local in the sense that the centers and radii are in a compact set, and the operator is local because, to reconstruct at $\mathbf{x}$, one needs only spheres that pass near $\mathbf{x}$. The microlocal properties of the reconstruction operator, including its symbol as a pseudodifferential operator, are given. The method is implemented using the approximate inverse, and reconstructions are given. They are evaluated in light of the microlocal properties of the reconstruction operator. (Received July 29, 2010)