1003-65-1046 **Charles L Epstein*** (`cle@math.upenn.edu`), 209 S. 33rd Street, Philadelphia, PA 191046395, and **Jeremy F Magland** (`jfm@math.upenn.edu`). *The Hard Pulse Approximation and the Inverse Scattering Transform.*

For many years, physicists working in magnetic resonance have used a very singular approximation of a smooth potential, the hard pulse approximation, as a device for avoiding ill conditioned problems that arise in the inverse scattering transform. We describe this approach and its application to solving the inverse problem with bound states for the AKNS system. (Received October 03, 2004)