1113-35-71 **Michael Victor Klibanov*** (`mklibanv@uncc.edu`), Department of Mathematics and Statistics, Charlotte, NC 28223. *Inverse scattering problems without the phase information.*

Inverse scattering problems without the phase information arise in imaging of nanostructures and biological cells. Sizes are of hundreds of nanometers, i.e. about 0.1 micron. Indeed, in these cases the wavelength must be of 1 micron or less. This means that the phase of the complex valued wave field cannot be measured, whereas only its modulus can be measured.

The governing PDE is the generalized Helmholtz equation. In the case of quantum scattering this is the Schrodinger equation. The inverse problem consists in determining the unknown coefficient of that PDE given measurements of the modulus of its solution. Unlike this, in the standard inverse scattering problem the whole complex valued wave field is measured.

In 2014 the author has published three (3) papers where uniqueness theorems were proven for that problem. However, proofs were not constructive. Thus, in 2015 the author jointly with V.G. Romanov has published/submitted five (5) papers where reconstruction procedures were proposed.

These results will be presented. In addition, some numerical reconstructions will be presented as well. (Received August 11, 2015)