962-65-1038 **Alexandra B. Smirnova*** (`smirn@cs.gsu.edu`), Dept of Math & Stat, Georgia State University, University Plaza, Atlanta, GA 30303. *Continuous algorithm for solving nonlinear ill-posed problems with simultaneous regularized inversion of the Fréchet derivative operator.*

Consider a nonlinear operator equation $F(x) = 0$. Let the operator F be twice Fréchet differentiable without such structural assumptions as monotonicity, invertability of F' etc. A principal point in the numerical implementation of different regularized procedures is the inversion of the operators $F' + \alpha I$ and $F'^{*}F' + \alpha I$ (see for example [1]). Such an inversion for certain operators is a nontrivial task as well as the reason of a decreasing accuracy in computations. The aim of my talk is to present an algorithm with simaltaneous regularized inversion of F':

$$\dot{x}(t) = -B(t)F(x(t)), \quad x(0) = x_0, \quad B(0) = B_0$$

$$\dot{B}(t) = -\Big(F'^{*}(x_0)(F'(x_0)B(t) - I) + \alpha(t)(B(t) - B_0)\Big)$$

and to prove a convergence theorem. It is assumed that the operator F satisfies the Newton-Mysovskii condition (see [2]).

References 1. R.G.Airapetyan, A.G.Ramm, A.B.Smirnova [2000] Continuous methods for solving nonlinear ill-posed problems. Amer. Math. Soc., Providence RI, Fields Inst. Commun., **25**, 111-137. 2. P. Deuflhard, H. Engl and O. Scherzer [1998] A convergence analysis of iterative methods for the solution of nonlinear ill-posed problems under affinely invariant conditions. Inverse Problems, **14** 1081-1106. (Received October 01, 2000)