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8. Analysis

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Zvyagin, Victor, Voronezh State University, Russia

Topological methods in the theory of perturbations of Fredholm maps and applications

In the talk we explain a construction of the degree of maps as $f + k$, where f is a proper, nonlinear Fredholm map with nonnegative index, and k is a completely continuous map. Formulae of calculation of the degree are given for some classes of equivariant maps of the mentioned type. We describe applications of constructed degree for the bifurcation problem of nonlinear Fredholm equations and for investigation of the structure of a set of solutions of nonlinear Fredholm maps. Applications for the bifurcation problem of nonlinear elliptic initial-boundary value problems and for investigation of the structure of a set of solutions of initial-boundary-value problems for equations of parabolic type are given.