THE USE OF THE GENERALIZED K-METHOD FOR THE MULTICHANNEL MEASUREMENT OF PLASMA DENSITY

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In the work the problem of refractometry is solving which consists in finding of electron density and center of plasma core at the plasma sounding by e-m ordinary wave for one view of sight scheme of scanning in computed tomography on tokamaks.

In refractometry e-m wave comes from transmitting antenna across the plasma to receptive antenna. The trajectory of beam is bending depending of plasma density that is in proportion to the refraction coefficient. The integrals of electron density by trajectory beams are proportional to the time of e-m wave spreading. In result there is possibility to find electron density and center of plasma core by time measuring’s of some beams along bending trajectories that is to solve the inverse Radon problem for one view of sight tomography. That can be done with the help of generalized K-method, going from initial approximation with straight trajectories. Further it’s necessary to make more exact the solution obtained taking into account the bending of beams (iteration process). But for this it’s necessary to get beam trajectories depending on solution of inverse Radon problem. The last problem is reduced to the problem of variation calculus on the base of Fermat principle that in one’s turn is equivalent to border problem with nonlinear ordinary differential equation of the second degree which is solving by shooting method (that is reducing to the series of Cauchy problems).