

# A Modified Trust Region Algorithm for Nonlinear Equations with New Updating Rule of Trust Region Radius

J. Fan<sup>1</sup>

**Abstract:** In this talk, we will present a trust region algorithm for the nonlinear equations with a new updating rule of the trust region radius, which takes some function of the residual. We show that under the local error bound condition which is weaker than the nonsingularity, the new algorithm converges quadratically to some solution of the nonlinear equations. Numerical results show that the new algorithm performs very well for some singular nonlinear equations.

---

<sup>1</sup> Department of Mathematics  
Shanghai Jiao Tong University  
800 Dongchuan Road, Shanghai 200240, China  
[jyfan@sjtu.edu.cn](mailto:jyfan@sjtu.edu.cn)