1086-37-1191   **Tiancheng Ouyang** (`ouyang@math.byu.edu`), Department of Mathematics, Brigham Young University, Provo, UT 84602, **Zhifu Xie*** (`zxie@vsu.edu`), Department of Mathematics and Computer Scienc, P.O.Box 9068, Petersburg, VA 23806, and **Duokui Yan** (`duokuiyan@gmail.com`), School of Mathematics and System Science, Beihang University, Beijing, Peoples Rep of China. *Linear Stability of the periodic solution in the spatial isosceles three-body problem.*

We show that the equal-mass spatial isosceles three-body periodic solutions (one body is oscillating on the symmetrical axis and other two bodies are rotating each other) are unstable in the full three-body problem but some of them are linearly stable in the symmetrical subsystem of the three-body problem. After a nice decomposition of the full space $\mathbb{R}^{12} = \Sigma \oplus \Gamma$, the problem of linear stability in the full three body problem becomes two separated linear stability problems in two orthogonal subspaces Σ and Γ. In the symmetrical subspace Γ, by applying Roberts' symmetry reduction, we show that the periodic solutions are linearly stable in some cases. However, in the subspace Σ, all the periodic solutions are linearly unstable. (Received September 19, 2012)