

# Review of: "Analysis of Traub's method for cubic"

S. F. Dehkordi<sup>1</sup>

<sup>1</sup> Shahid Chamran University of Ahvaz

**Potential competing interests:** No potential competing interests to declare.

Here is my feedback on the analysis paper:

Overall:

- The paper provides a good dynamical analysis of Traub's method for finding roots of cubic polynomials. Extending previous 2D analysis to 3D is non-trivial and provides new insights.
- The writing is clear, and the explanation of concepts is detailed. Equations and figures aid understanding.
- There is a logical flow, starting with an introduction to root-finding methods, then specifics on Traub's method, the dynamical analysis, and finally the conclusions.

Specific comments:

- The introduction gives good context by covering different root-finding methods and their convergence rates. This sets up the motivation for studying Traub's method.
- Transforming the quadratic surface to a hyperboloid of one sheet provides a simpler form to analyze. The visualization with changing radius depending on the parameter is helpful.
- Showing the focal curves are hyperbolas and the points on them are simple focal points via the non-parallel tangent plane criteria is a nice rigor.
- The analysis and visualization of the prefocal surfaces as cylinders adds nicely to understanding the dynamics.
- Finding the inverse map and delineating the regions where it is defined gives useful insight into the global dynamics. Comparing to previous methods is good for context.

Overall, it is a very nice, thorough analysis that clearly explains the dynamical properties. I did not notice any significant issues. It is ready for submission in my opinion.