Review of “Optimization and Active Stabilization of a Far-Infrared Laser for NSTX-U High Poloidal Wavenumber Scattering Diagnostics”:

The manuscript presents a detailed study on the optimization and active stabilization of a far-infrared (FIR) laser system, including its design and alignment. This work is particularly compelling due to its comprehensive discussion on FIR laser construction and systematic calibration methods. The findings hold significant value for the research community, offering practical guidance for enhancing FIR laser output power.

As an essential component in plasma diagnostics, FIR lasers provide key advantages such as high power and excellent directionality, though they often require high maintenance. The authors propose a method for periodic output power optimization, involving daily adjustments of mirror spacing during daily operation and monthly optical alignment procedures.

There are several minor revision suggestions that need to be clarified to improve the paper:

1. The manuscript is mostly clear, but a few grammatical errors and awkward phrases could benefit from proofreading. Examples: “Mythology” should be corrected to “Methodology” in the author's contributions.

2. The power stability improvement after feedback activation is shown qualitatively, adding RMS fluctuation or standard deviation values would strengthen the claim.

3. The paper could be strengthened by comparing the proposed FIR laser system to other diagnostic approaches (e.g., microwave or other laser-based systems) in terms of performance, cost, or complexity. This would better highlight the system’s unique advantages.

4. The font size of Fig. 9e is too small. Please replace it with a bigger font size.

Recommendation:

Accept with Minor Revisions