Dear CFS Team,

I am writing to express my strong interest in the Diagnostician role on the SPARC Tokamak Team at Commonwealth Fusion Systems. With a Ph.D. in plasma physics from the University of Science and Technology of China and a postdoctoral appointment at UC Davis, I bring a deep understanding of fusion physics, coupled with hands-on experience in diagnostic system development and modeling.

In my current research, I have developed advanced computational tools—a kinetic solver for 0D2P runaway electron dynamics that self-consistently accounts for electric-field acceleration, collisions, synchrotron damping, and avalanche growth. This work demonstrates my ability to build predictive models that are directly relevant to high-field tokamak operations. I also developed a 2D FDTD beam-tracing program to optimize wave propagation for diagnostic design, which underlines my experience in high-performance simulation, algorithm development, and aligning computational tools with experimental needs.

Beyond modeling, I have extensive experience with fusion diagnostics. I led upgrades and commissioning of millimeter-wave and laser-based diagnostics on NSTX-U, DIII-D, and EAST. In these projects, I collaborated cross-disciplinarily on optical design, automation (LabVIEW, MATLAB and Python), and experimental commissioning. These experiences give me practical insight into diagnostic hardware, calibration, and integration with control systems—which closely aligns with the Diagnostician role's responsibilities of shepherding diagnostics from design through installation, calibration, and operation.

I am particularly excited by the opportunity at CFS to contribute to about 40 diagnostic sub-systems (e.g., ECE, reflectometry, spectroscopy, Langmuir probes) and to work on integrating diagnostics with both real-time plasma control systems and physics operations. My background in both high-fidelity modeling and hands-on diagnostic development positions me well to contribute meaningfully to SPARC's mission.

I believe my combination of simulation expertise, code development, and experimental diagnostic experience will enable me to make immediate impacts— working with your integrated diagnostic team, helping ensure diagnostic designs are robust, commissioning systems efficiently, and contributing to the first-plasma operations with a deep physics perspective.

Thank you for considering my application. I would be thrilled to discuss how my skills and experience align with CFS's goals for SPARC diagnostics and how I can contribute to achieving first plasma.

Sincerely,

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