

SUBCRITICAL SYSTEMS · JOB OPPORTUNITY

RF Analyst – SRF Cavities



Department *Engineering*

Posted *September 24, 2026*

Location *Austin, TX*

Employment *Full Time*

ABOUT SUBCRITICAL SYSTEMS

Subcritical Systems, Inc. is a venture-backed startup in Austin, Texas building the accelerator driven systems and the only US commercial manufacturer of accelerator cavities. What Space X did for rockets, we plan to do for accelerator cavities and commercialize across applications of power production, medical isotopes, semiconductors and waste transmutation.

We are in the process of building the Energy Amplifier — a novel nuclear fission system in which a particle accelerator drives a subcritical core, making meltdown physically impossible for clean power production. Due to its inherent safety, our system has a more streamlined licensing process. Our founding team includes successful entrepreneurs with a track record of building several multibillion dollar companies in deep-tech, and scientists who were leading U.S. national labs with deep experience in accelerator & nuclear technologies.

We are actively hiring to expand our team as we work toward licensing, regulatory submissions, and construction of our first energy amplifier. More information is available at subcritical.com.

ROLE SUMMARY

This role leads the electromagnetic design of the superconducting RF cavities inside Subcritical Systems' AI-driven SRF cryomodules. You will set cavity shape, and optimize the figures of merit that drive accelerator performance and subsystem cost – accelerating gradient, peak surface fields, geometric factor, shunt impedance; while accounting for beam-cavity interactions: beam loading, input coupling, beam stability, multipacting, and field emission. You will be the technical authority for SRF cavity RF design, working closely with SRF, mechanical, cryogenic, electrical, and manufacturing engineers to carry cavities from concept through fabrication, cold testing, and commissioning.

You'll run design iterations with ATLAS, our internal AI-assisted engineering platform, feeding it validated models, physical constraints, and test data, and verifying its outputs against physics and measurement before they reach detailed design or the shop floor.

KEY RESPONSIBILITIES

- Own the electromagnetic design of SSI's SRF cavities, from requirements and frequency choice through fabrication drawings and cryomodule integration.
- Optimize cavity geometry for gradient, intrinsic quality factor, R/Q, geometric factor, and peak surface fields using CST, HFSS, COMSOL, or equivalent solvers.
- Analyze beam-cavity interactions: beam loading, HOM spectra, impedance, and wakefields. Design input and HOM couplers for the required external quality factors and damping.

- Evaluate multipacting, field emission, and RF heat loads, and work with mechanical engineers on coupled RF-structural analysis (Lorentz force detuning, df/dP , tuning sensitivity).
- Set RF acceptance criteria and support frequency and field-flatness tuning, bead-pull, and cold-test measurements, correlating results with simulation.
- Develop scripts and computational tools to automate parametric simulation and optimization, and present results in design reviews.
- Iterate designs with ATLAS and the broader team, review its outputs before they proceed to fabrication or testing, and promote a proactive safety culture.

QUALIFICATIONS

Required

- Master's degree in Physics, Electrical Engineering, or a related discipline; PhD preferred.
- 3+ years of RF cavity, high Q filter, or accelerator design experience, or 7+ years of broader professional experience in RF or electromagnetics.
- Background in 3D electromagnetic design of resonant cavities using CST, HFSS, or equivalent eigenmode and frequency-domain solvers.
- Working knowledge of RF superconductivity and cavity figures of merit: quality factors, surface resistance, geometry factor, R/Q, shunt impedance, and surface-field optimizations.
- Understanding of beam-cavity interactions, including beam loading, coupling, and higher-order modes.
- Ability to work across disciplines and produce clear design reports, specifications, and presentations.

Preferred

- Experience designing SRF cavities (elliptical, spoke, half- or quarter-wave) for proton or electron linacs, including couplers.
- Experience with multipacting and wakefield codes and coupled RF-structural simulation.
- Experience with RF measurement and tuning (network analyzers, bead-pull, field flatness) and cold testing of SRF cavities.
- Experience with Python or MATLAB scripting, parametric optimization, or AI-assisted engineering workflows, including physics-based validation of computational outputs.

BENEFITS

Benefits: We offer health, dental, and vision insurance.

LOCATION & WORK POLICY

This role is fully in person in Austin, Texas. Our facility is located next to Austin Airport.

HOW TO APPLY

Apply on LinkedIn or submit your resume and a brief cover letter to careers@subcritical.com with the subject line "RF Analyst – SRF Cavities - Application". Applications are reviewed on a rolling basis.