

High Power RF Electrical Engineer

Job Title - High Power RF Electrical Engineer

Accelerator Division

Job Description

Open Date: May 24, 2021

Close Date: June 14, 2021

Fermilab is America's best-in-class laboratory for particle physics and accelerator research, funded by the U.S. Department of Energy. We support discovery science experiments in Illinois and at locations around the world, including deep underground mines in South Dakota and Canada, mountaintops in Arizona and Chile, and the South Pole!

Fermilab seeks a highly motivated **Electrical Engineer** in the Accelerator Division RF Department's High-Level RF Group to support growing project needs for the new PIP-II particle accelerator, featuring a new 800 MeV superconducting linear accelerator. The selected candidate will work in a design team environment under the supervision of a scientist or a more senior engineer. The candidate will work with:

- High power RF systems (e.g. 1 to 60-kilowatt solid state amplifiers, 200-kilowatt wide-band tetrode RF amplifiers, 30 kilowatt IOT amplifiers, and 0.3 to 10 megawatt klystron amplifiers) with associated support hardware,
- high frequency analog and digital circuit design,
- assist with current and future RF systems operation and maintenance.

Candidate will have the opportunity to work closely with signals and systems directly affecting accelerator performance as well as have opportunities for hands-on learning of particle accelerator systems.

You will

- Assist in the development, fabrication, and testing of tunable high-power copper accelerating structures (ferrite loaded RF cavities).
- Design, develop, implement and maintain hardware for current and future high-power RF systems, including low level control circuitry to high power RF amplifiers.
- Participate in the daily operation of RF systems including solving problems.
- Collaborate with technical staff to verify system functionality and performance.
- Perform engineering analysis, write reports and create presentations.
- Abide by all environment, safety, and health regulations
- Contributes optimally within a diverse workforce and upholds Fermilab's dedication to equity, diversity, and inclusion.

We are looking for

- Bachelor's Degree in electrical engineering from an ABET accredited institution with 4 + years of experience.
- Background in high power design, development, implementation and maintenance of hardware for high power RF systems. Some experience in high voltage & high current pulsed RF systems is highly desired.
- Knowledgeable in high frequency analog and digital circuits hardware design including interfacing between low level systems and high-power RF equipment.
- Hands-on electronics hardware experience with oscilloscopes, signal generators, vector network analyzers, and spectrum analyzers is required.
- Strong verbal and written communication skills in English.
- Must be able to work in a team environment.
- Must be able to see the big picture and pay attention to details while performing problem solving analysis on a flexible range of tasks.
- Ability to apply critical thinking and knowledge of electronic principles and electrical theory to accomplish engineering designs.
- Some experience with Microwave Studio, HFSS, Mathematica, MatLab, LabView, and ADS HF/microwave software preferred.
- Experience with high power RF amplifiers preferred (e.g. Klystrons, Tetrodes, IOTs, and Solid State).

Physical Activity and Work Conditions

The position is normally scheduled for a daytime shift, though occasional off-shift machine studies and/or emergency call-ins shall be required as knowledge and skills develop.

Human Factors: Mental Concentration, Sitting, Standing, Tight Work Schedule, Visually Demanding

Chemical Factors: Solvents

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