

Advertisement for Research Associate (RA) position

Project CODE: FT-H&CD-0001/RA/2026		
1	Title of the Project	Development of a Water-Cooled Thermal Management System under High-Power RF Test Facility
2	Domain Area	Experiment
3	Project Category as found relevant	Heating and Current Drive
4	Desirable Qualification/Experience required for the post:	Ph.D. in Mechanical Engineering
5	Brief Summary about the Project (500 Words)	The ICRH Section at IPR is developing a High Power RF (HPRF) Test Facility to create calibrated mismatch conditions that replicate the actual operating conditions of the ICRH system in a tokamak. The primary objective of this facility is to test RF components under controlled mismatched conditions before their installation in the ICRH network of a tokamak. Under mismatched operating conditions, certain sections of the ICRH matching network are subjected to time-varying, very high-voltage and high-current stresses that may exceed the normal operating limits of the transmission lines. These extreme conditions can lead to RF breakdown and arcing, resulting in localized power deposition and the development of severe thermal loads at specific locations. Therefore, it is essential to evaluate RF components under similar calibrated mismatched conditions before deploying them in the ICRH network of a tokamak. The HPRF Test Facility will generate calibrated mismatch conditions with known Voltage Standing Wave Ratio (VSWR), voltage maxima, and current maxima, enabling reliable evaluation of RF components under representative high-power operating conditions. In the ICRH system, rigid coaxial transmission lines (6-1/8-inch and 9-3/16-inch) are extensively used for high-power RF power transmission and

		for the fabrication of various RF components due to their excellent high-power handling capability. The proposed HPRF Test Facility incorporates an efficient thermal management system to dissipate the heat generated at different locations under extreme high-current operating conditions. The development of a water-cooled thermal management system for the HPRF Test Facility is particularly challenging because of the complex structural design of the RF components and the limited space available for cooling channels and heat dissipation. The Research Associate (RA) will be responsible for the design and development of an efficient water-cooled thermal management system that provides adequate cooling while maintaining a compact mechanical design and accommodating the limited space available within the HPRF Test Facility
6	Any other information/remarks	-