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**Triple Probe Array on Irvine FRC** E. TRASK, E.P. GARATE, W.S. HARRIS, W.W. HEIDBRINK, R. MCWILLIAMS, T. ROCHE, UC Irvine — A new triple probe implementation has been designed and tested on the Irvine Field Reversed Configuration (IFRC). Difficulties occur in normal triple probe measurements on IFRC due to two main reasons: short plasma lifetime and a nonconductive vacuum vessel. The new design addresses these issues by allowing pairs of probe tips to float with the plasma. The signal pairs are coupled across a wide bandwidth isolation transformer. Key features include measurement of the floating potential by capacitive coupling between the primary and secondary of the transformer, and the use of only two probe tips to extract the information necessary to solve for the electron temperature and density. The temperature is measured by differential amplification of the floating potential and capacitively-coupled high side of the double probe pair. The ion saturation current is measured by amplifying the transformer differential voltage. The electronics bandwidth is approximately 0.5 kHz to 2 MHz as tested on the bench. Initial results on IFRC indicate densities of mid  $10^{12}/\text{cc}$  and electron temperatures of 3 to 5 eV.

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