

# Plasma Physics Seminar

Physics & Astronomy Building (PAB) Room 4-330

Via Zoom: <https://ucla.zoom.us/j/92785449357?pwd=SVBTSko3bTdEUW03dzQwNks1Q2IKZz09>

Friday, April 21, 2023

11:30 AM Lunch will be served

## RF Sheath Mitigation and RF Wave Coupling Studies for Optimal ICRF Heating

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**Abstract:** Ion cyclotron range of frequencies (ICRF) heating in fusion plasmas is significantly hampered by the phenomenon of RF sheath rectification. Addressing RF sheaths and their related effects, such as impurity generation and convective cell formation, is important to make ICRF an effective heating option for future fusion devices. Experiments were performed on the Large Plasma Device (LAPD) using a single strap ICRF antenna to better understand how to mitigate RF sheath formation and wave-coupling to the slow and fast wave. The purpose of this talk is to present results from such experiments. The initial set of experiments explored the effects of electrically insulating antenna enclosures on RF-rectified sheaths. The results from these experiments showed that covering or replacing RF sheath-prone surfaces with insulating materials (MACOR) can help mitigate RF-induced formation of large DC sheath potentials. In order to further explore the DC RF sheath mitigation seen in experiments, further experiments were executed with different thickness MACOR enclosures. Lastly, results from additional work done to document the parasitic lower hybrid (slow) wave in the LAPD will also be presented. These experiments pave the way for future experiments for studying wave coupling at high-power and the respective consequences, such as far-field sheaths and other non-linear processes.