

Common Task A: Plasma/Liquid-Surface Interactions and Plasma Edge Modeling

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FY 2002 Tasks:

Task I related - Near-term experiments

(APEX – 0k)

- Characterize C-MOD, NSTX edge-plasma for ALIST liquid-module design (LLNL, ALPS-funded)
- Provide edge-plasma modeling for CDX-U and benchmark with data (LLNL/ORNL, ALPS-funded)
- Benchmark models for lithium distribution in edge region from DiMES probe (ANL/GA/ORNL/LLNL, ALPS-funded)

Task II related - High-payoff exploratory concepts

(APEX – 19k LLNL, ?k GA)

- Assess kinetic corrections from MCI code needed for edge-plasma fluid model (UEDGE) in low-density, low-recycling regime (GA/LLNL, Evans, same as FY01, Rensink 5k)
- Continue studies of auxiliary vapor heating to retard impurity influx (LLNL, Rognlien, Rensink 14k)

Task III related - Integrated design of liquid-wall system

(APEX – 19k LLNL)

- Perform integrated divertor/wall simulations including sheath effects and specific divertor geometry (ANL/LLNL/SNL, ALPS-funded)
- Assess impurities from Flinabe, Ga, & Li walls for CLIFF-like design (LLNL, Rognlien, Rensink 10k)
- Determine helium plasma concentrations and profiles adjacent to surfaces or ducts to optimize pumping (LLNL, Rognlien, Rensink 9k); connect to helium retention in liquids (ANL, Hassanein, ALPS-funded)
- Impact of ELMs and disruptions (ANL, ALPS-funded)