

Abstract Submitted
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Report on the installation of Compact Neutral Particle Analyzer on SSPX for Ion Temperature Measurements¹ EPHREM MEZONLIN, JOSEPH JOHNSON III, Florida A & M University, DAVID HILL, BICK HOOPER, HARRY MCLEAN, REG WOOD, SSPX, Livermore, CA — Using a Compact Neutral Particle Analyzer (CNPA), the relationship between ion temperatures in the spheromak plasma and turbulent signatures in magnetic field fluctuations and species density fluctuations will be investigated in the SSPX at LLNL. Ion temperature measurements will also be useful for a better understanding of energy confinement in spheromak plasmas. The ion temperatures will be inferred from measurements of the energy distribution of charge-exchanged neutrals. To do this requires a careful vacuum analysis, which has now been performed, to be certain that the installation of the CNPA will not have any detrimental effects on the SSPX vessel. This analysis takes into account the main three components of this system: the gas stripping cell; the CNPA; and the SSPX vessel. Once the installation is completed, we will measure the energy indicators with sub-millisecond temporal resolution in order to correlate T_i with changes in magnetic and emission fluctuations related to the formation and sustainment processes in the spheromak discharge.

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