Double Langmuir Probe Analysis Freeware: DLPGUI NECIP B.
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probe (DLP) is an important diagnostic tool that can be used to characterize various
types of plasmas. Unlike the single Langmuir probe (SLP), DLP withdraws no net
current from the plasma; therefore, it can be used to do measurements on plasmas
that are small and time-varying. However, DLP can measure fewer parameters than
SLP. With appropriate data analysis, electron temperature (T_e), positive ion density
(n_i) and the local field can be determined using DLP measurements. For the analysis
of measured I-V curves, one must choose an electron energy distribution function
(EEDF) *a priori*, and in literature, the methods of analysis generally assume a
Maxwellian EEDF. In this work, we review and discuss available theories to reliably
evaluate T_e and n_i from DLP I-V curves and incorporate those theories into a new
and free analysis software named DLPGUI. DLPGUI acts both as a theoretical
compendium and a flexible analysis tool. With a graphical user interface, DLPGUI
allows the user to choose from a list of ion flux models of varying collisionality and
different EEDFs before performing analysis of I-V data. The software also provides
an approach to extract n_i from measurements conducted in gas mixtures.

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