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CROSS-PLATFORM, MULTI-LANGUAGE LIBRARIES FOR IONIZATION AND SURFACE INTERACTION EFFECTS IN PLASMAS*

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We are developing a library of numerical algorithms for modeling plasma effects such as ionization, secondary electron production, and ion-surface interaction. The goal is to make this library accessible to a large number of researchers by making it available on multiple computing platforms (Linux, Windows, Mac OS X) and available in multiple computing languages (Fortran, C, Python, Java). We discuss our use of the GNU autotools and the Babel utility to accomplish this cross-platform, multi-language interface. We then discuss application of this library within the WARP particle-in-cell code for modeling effects of ion-induced electrons in the High Current Experiment and within theVORPAL particle-in-cell code for modeling kinetic effects in hollow cathode discharges.

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