Synthetic capability for the study of poloidal impurity asymmetries in NSTX-U L. F. DELGADO-APARICIO, R. E. BELL, M. PODESTA, B. P. LEBLANC, A. DIALLO, PPPL, L. MORTON, Oak Ridge Associated Universities, H. YAMAZAKI, Y. TAKASE, University of Tokyo, M. ONO, PPPL — A new capability has been built to compute the two-dimensional mapping of impurity density asymmetries in NSTX-U. This technique relies on flux-surface quantities like electron and ion temperature ($T_{e,i}$) and rotation frequency (ω_ϕ), but finds the 2D electron, deuterium and carbon density profiles self-consistently assuming the presence of a poloidal variation due to centrifugal forces. The solution for the electrostatic potential for the measured carbon density and central toroidal rotation using NSTX data will be shown and compared with the values derived using Wessons formalism which assumed that the main intrinsic impurity was in the trace limit. The presence of O, Ne, Ar, Fe, Mo and W are considered at the trace limit with very small changes to quasineutrality and Z_{eff}. The few assumptions made considered a zero electron mass, a deuterium plasma, a trace impurity with charge "Z" given by coronal equilibrium ($Z = Z(T_e)$) and equilibrated ion temperatures (e.g. $T_D = T_C = T_Z$). This capability will help in the understanding of asymmetries before tearing modes onsets as well as aid the design of new diagnostics for NSTX-U.

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