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## 14.43 Zeff Measurements and Spectroscopic Impurity Survey on the C-2W Field-Reversed Configuration Plasma

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In C-2W, an elevated impurity concentration, or the presence of high-Z impurities, can account for significant energy losses through radiation. To gauge plasma contamination from impurities, the effective ionic charge ( $Z_{\text{eff}}$ ) can be determined from measurements of Bremsstrahlung continuum radiation over a small spectral range free from line radiation. To this end, an integrated diagnostic system including visible and near-infrared Bremsstrahlung detectors, as well as Blamer-alpha ( $D\alpha$ ) neutral detectors for pollutant removal, will be deployed in C-2W for improved estimates of time-dependent radial distributions of  $Z_{\text{eff}}$ . The system is complemented by an array of survey spectrometers which enable full-range spectroscopic measurements of impurity emission lines from the vacuum ultraviolet to the near infrared, providing a good picture of the plasma composition. Here, the design scheme for this integrated diagnostic system is presented and discussed.

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