Previous experiments on the 1 MA Zebra generator at UNR were dedicated to studies of precursor plasmas with Ni-60 alloy (96% Cu) cylindrical wire arrays (CWA). Those precursor plasmas were shown to consistently have electron temperatures > 400 eV. Continuing research at 1 MA on Zebra found precursors for Cu, Brass, and Alumel CWAs to be consistent with Ni-60 results. Recent Ni-60 CWA experiments have been performed on Zebra using a Load Current Multiplier (LCM) that raises the current up to 1.7 MA. A full set of diagnostics included 10 beam lines. These CWAs consist of 6 wires evenly spaced in a 12 mm diameter as before, but with a linear mass density of 100 µg/cm, more than double the mass density in 1 MA experiments. The radiation yield per unit length in the LCM shots, 16 kJ/cm, (with decreased 1 cm anode-cathode gap) has approximately doubled the previous Ni-60 yield per unit length. The total integrated PCD energy (filtered with 8 µm Be) increases up to 750 J (compared to the previous ~500 J). The percentage of the PCD due to the precursor has remained relatively constant. Non-LTE kinetic models of Cu and Ni have been applied to account for the L-shell radiation from the precursor and main x-ray burst plasmas. The resulting plasma parameters from modeling of TGSI and TISR spectra together with analysis of corresponding images allow for the study of precursor plasma formation in time and in space, respectively.


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