Abstract Submitted
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Emission Spectra of Low-Z Atoms for Lasing Without Inversion in Helium-Like Atoms[1] JAMES MITRANI, Princeton University, Princeton Plasma Physics Lab, HUI XIA, Princeton University, Texas A&M University, SZYMON SUCKEWER, Princeton University, Princeton Plasma Physics Lab — Emission lines relevant to lasing without inversion (LWI) studies were observed. LWI in low-Z helium-like atoms presents a technique for achieving gain in the vacuum ultraviolet (VUV) and soft X-ray regimes. For helium-like atoms, the 2^3S – 2^3P transition is used as the pumping transition, and the 2^3P – 1^1S is used as the lasing transition. In helium-like boron (B IV) and carbon (C V), the pumping transition wavelengths are 282.2 and 227.8 nm, respectively, and the lasing transition wavelengths are 6.1 nm and 4.1 nm, respectively. Laser ablated boron and carbon plasmas were created, and their emission spectra were studied in the visible and VUV regimes. In the visible regime, emission spectra show the presence of helium-like boron through the 2^{nd} order of the 282.2nm, 2^3S – 2^3P transition line (at 564.4 nm). Emission spectra in the VUV and soft X-ray regimes will be presented and discussed. Future experiments include measurements of experimental properties of these plasmas for the purpose of LWI in the VUV and soft X-ray regimes.

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