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Studies to Enhance Superconductivity in Thin Film Carbon BENJAMIN PIERCE, LYLE BRUNKE, JACK BURKE, DAVID VIER, ANDREW STECKL, TIMOTHY HAUGAN, None, WPAFB/AFRL COLLABORATION, UNIVERSITY OF CINCINNATI COLLABORATION, UNIVERSITY OF CALIFORNIA SAN DIEGO COLLABORATION — With research in the area of superconductivity growing, it is no surprise that new efforts are being made to induce superconductivity or increase transition temperatures (T_c) in carbon given its many allotropic forms. Promising results have been published for boron doping in diamond films, and phosphorus doping in highly oriented pyrolytic graphite (HOPG) films show hints of superconductivity.. Following these examples in the literature, we have begun studies to explore superconductivity in thin film carbon samples doped with different elements. Carbon thin films are prepared by pulsed laser deposition (PLD) on amorphous SiO_2/Si and single-crystal substrates. Doping is achieved by depositing from ($C_{1-x}M_x$) single-targets with M = B_4C and BN, and also by ion implantation into pure-carbon films. Previous research had indicated that Boron in HOPG did not elicit superconducting properties, but we aim to explore that also in thin film carbon and see if there needs to be a higher doping in the sample if trends were able to be seen in diamond films. Higher onset temperatures, T_c , and current densities, J_c, are hoped to be achieved with doping of the thin film carbon with different elements.

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None

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