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Investigation of neutral and ion dynamics in a HiPIMS plasma by tunable laser diode absorption spectroscopy (TDLAS) PATRICK PREISSING, ANTE HECIMOVIC, ACHIM VON KEUDELL, Ruhr-Universitt Bochum — High power impulse magnetron sputtering (HiPIMS) discharges are known for complex plasma interactions, and complex temporal and spatial dynamics. Spatial and temporal dynamic of argon metastable (Ar^m), Ti atom (Ti^0) and Ti ion (Ti^+) density and temperature is studied by an extended tunable diode laser absorption spectroscopy setup (TDLAS) during a HiPIMS pulse. The TDLAS setup used a beam expander in combination with a 6 photo diode array to simultaneously measure spatial (resolution 5 mm) and time resolved absorption profiles of an Ar^m, Ti^0 and Ti^+ transition. This in combination with moving the magnetron in axial direction gives a complete 2D map of the density evolution. Temporal resolution of 400 ns was achieved by recording the photo diode signal on the National Instruments card. Final results allowed to investigate temporal evolution of the observed species in the volume between the target and the substrate.

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