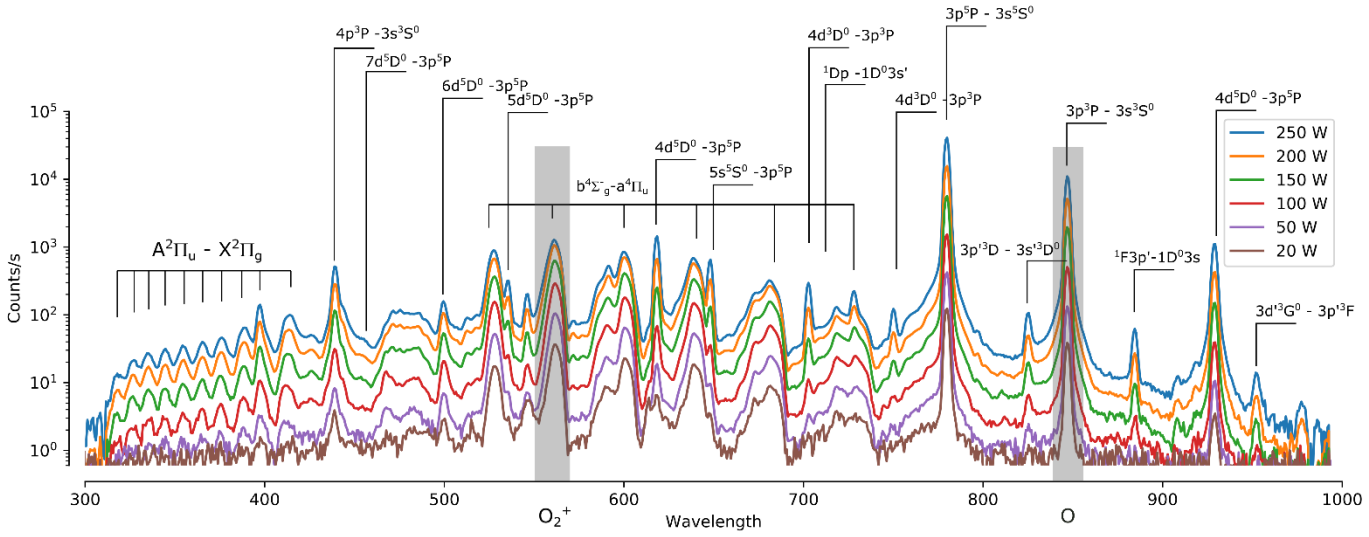


**Figure 1:** Optical emission spectra of plasma at different powers with line identification. The amount of observed (excited) species increases in a quadratic way with the power. This implies that the concentration of species in the ground state increases linearly with the power.

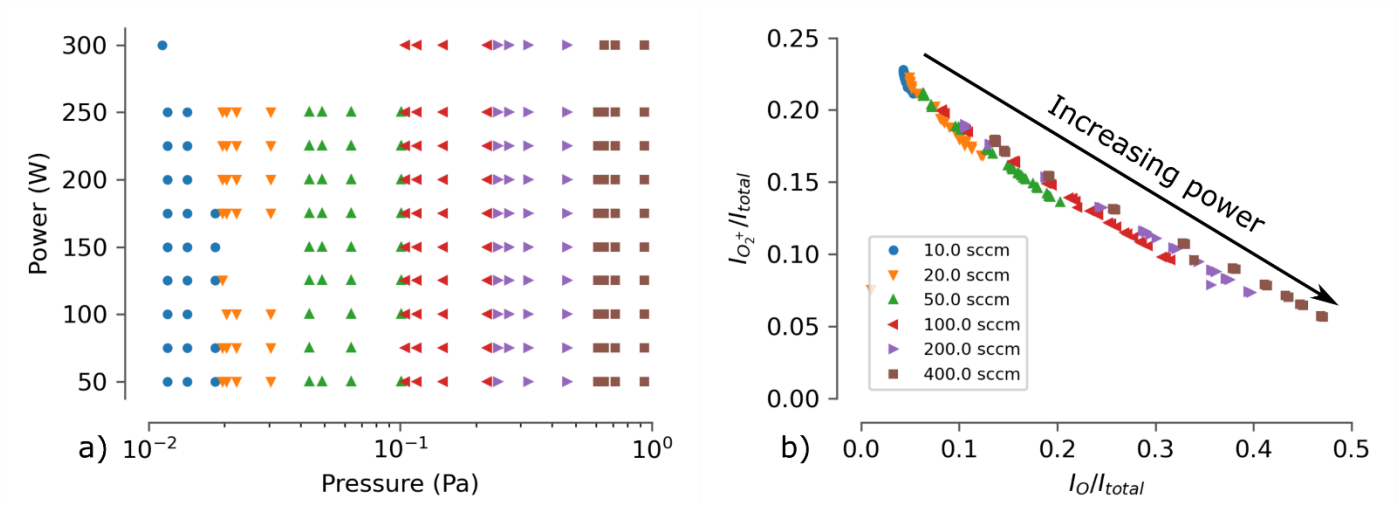


**Figure 2:** a) parameter space probed with optical emission spectroscopy (300-1000 nm). Every marker is a spectrum. Different pressures for the same flow were obtained by using a throttle valve. b) All spectra in a) were normalized, and selected peaks were integrated (O: 840-850 nm, $O_2^+$: 547-566 nm, see figure 1). The $O/O_2^+$ ratio increases with increasing power and increasing flow, which can be related to a decreasing electron temperature. The pressure has not too much influence on the ratio.

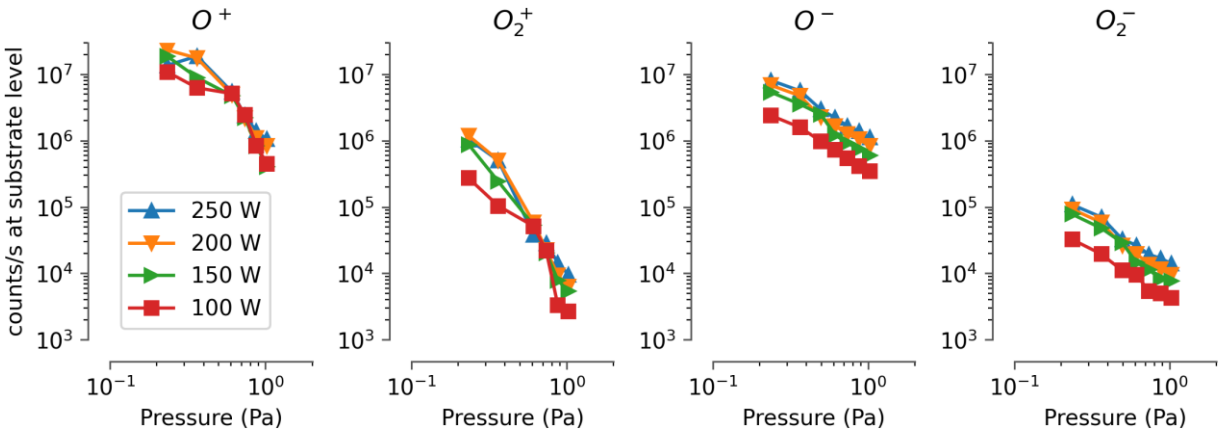


**Figure 3:** Ion concentrations at substrate level, integrated over energy. Data for other powers confirmed the trends and are omitted for clarity.

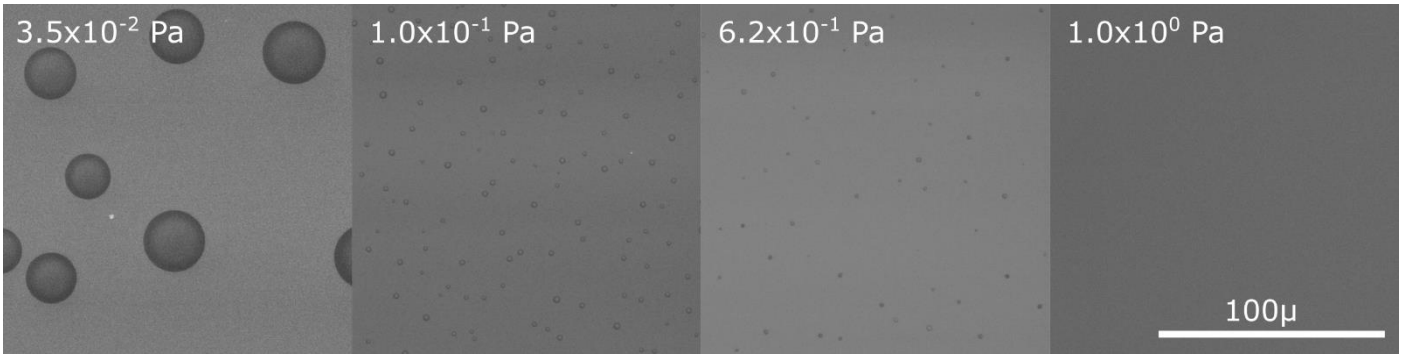


**Figure 4**: Effect of changing pressure on film quality when the gas enters the reactor from the side (as opposed to from the top of the plasma column). Bubbles are formed because of ion bombardment at low pressures, resulting in films under compressive stress.

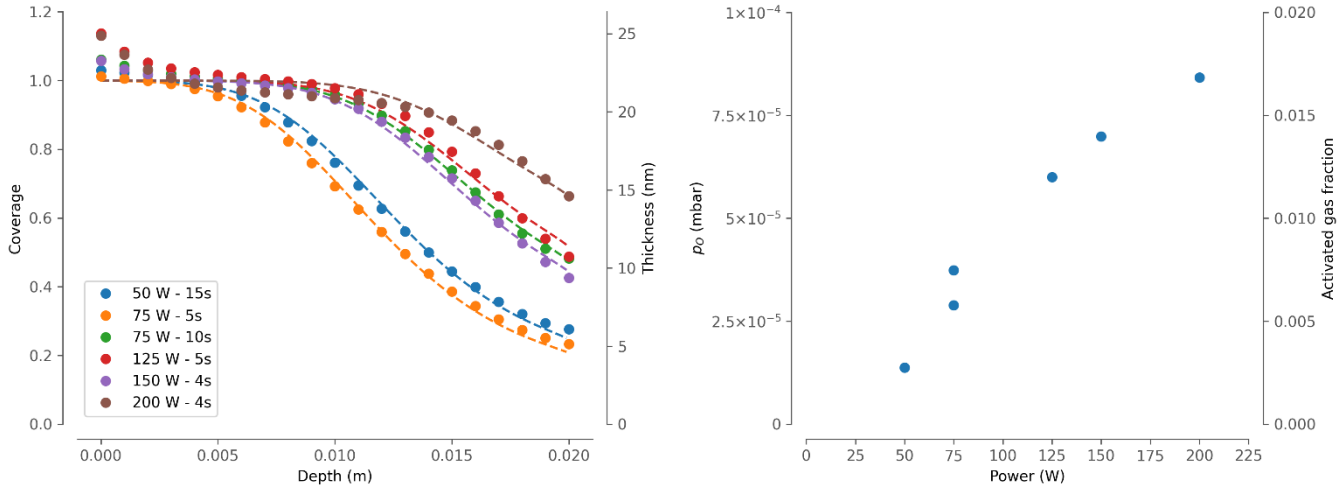


**Figure 5:** Conformality analysis of the deposition thickness profiles in high aspect ratio test structures. This analysis confirms the linear correlation between the partial pressure of the active species and the plasma power. a) experimental profiles and least-squares fit b) partial pressure at the entrance necessary to get the profiles in a. These pressures were calculated for species with mass 16 (O), deposition temperature 120°C, and an area of $10^{-18}$ nm² per site.