

Abstract Submitted
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Sheath and bulk expansion induced by RF bias in atmospheric pressure microwave plasma¹ JIMO LEE², WOJIN NAM, JAE KOO LEE, GUNSU YUN, Pohang University of Science and Technology — A large axial volume expansion of microwave-driven plasma at atmospheric pressure is achieved by applying a low power radio frequency (RF) bias at an axial location well isolated from the original plasma bulk. The evolution of the plasma plume visualized by high speed ICCD imaging suggest that the free electrons drifting toward the bias electrode cause the prodigious expansion of the sheath, creating a stable plasma stream channel between the microwave and the RF electrodes. For argon plasma in ambient air, enhanced emissions of OH and N₂ spectral lines are measured in the extended plume region, supporting the acceleration of electrons and subsequent generation of radical species. The coupling of RF bias with microwave provides an efficient way of enlarging the plasma volume and enhancing the production of radicals.

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