

Abstract Submitted  
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**Optical emission spectroscopy of 'spokes' in a high power impulse magnetron discharge**<sup>1</sup> JULIAN HELD, ANTE HECIMOVIC, VOLKER SCHULZ-VON DER GATHEN, Ruhr University Bochum — Localized regions of intense light emission can be observed in front of the target of a high power impulse magnetron sputtering (HiPIMS) discharge. These regions are often referred to as 'spokes' and have been observed to rotate in  $E \times B$  direction with frequencies in the order of 100 kHz. The spokes are located close to the target inside the zone of magnetic confinement where the magnetic field lines are closed. Outside this zone, the HiPIMS discharge has already been investigated thoroughly by the community using Langmuir probes. However, inside this zone a probe would change the magnetic field and disturb the discharge. In this work, the spokes are therefore investigated using optical emission spectroscopy. A high resolution plane grating spectrograph combined with a fast, gated, intensified CCD camera is employed to analyse the discharge. Line broadening of the Balmer series of atomic hydrogen is studied by adding a small admixture of hydrogen to the argon used as the working gas. Additionally, the influence of reactive admixtures on the discharge, such as nitrogen or oxygen, is investigated.

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Julian Held  
Ruhr University Bochum

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