

MonPS34

**Duty Factor Variation Investigation from 1% to 100% with One
Microwave Driven Cs-Free Volume H⁻ Source at PKU**

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A microwave driven Cs - free volume H⁻ source, that has the ability to deliver tens mA H⁻ at 35 keV, was developed at Peking University (PKU)[1]. Recently special efforts were paid on the investigation of duty factor variation possibility from 1% to 100% with one of this kind source. Experiments were carried out with a fixed pulsed length of 1 ms and different intervals of 99 ms, 49 ms, 39 ms, 29 ms, 19 ms, 9 ms, 4 ms, 2 ms, 1 ms, 0.5 ms and 0 ms, respectively. Experimental results prove that this source can deliver tens mA H⁻ beam at different duty factor. The RF power efficiency increases from 6 mA/kW to 20 mA/kW when the duty factor grows from 1% to CW at a fixed RF power. Under a given duty factor, RF power efficiency keeps constant and the H⁻ current increases with RF power linearly. Detail will be presented in the paper.

[1] Yuan Xu, Shixiang Peng, Haitao Ren, Tao Zhang, Ailin Zhang, Jingfeng Zhang, Jie Zhao, Zhiyu Guo and Jia'er Chen, Gas flow influence on negative hydrogen ion generation within the microwave-driven negative ion source. **WEPWA027**, *Proceeding of IPAC 2105*, 3rd-9th May, 2015, Richmond, Virginia, USA.