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# Plasma Immersion Ion Implantation for Semiconductor Industries: Specific Challenges and Example of Applications for Advanced Devices (Invited talk)

Yohann Spiegel<sup>\*†1</sup>, Frank Torregrosa<sup>1</sup>, Julian Duchaine<sup>1</sup>, and Laurent Roux<sup>1</sup>

<sup>1</sup>Ion Beam Services (IBS) – IBS – France

## Abstract

Beam Line implantation covers the main part of the doping market in semiconductor industry. Collaborative development work done by tool supplier and semiconductor founder allowed to have a good control and theoretical approach of this technology, which helped customers to become very confident in it. However, facing the continuous evolution of semiconductor devices, doping actors have to improve their technologies. While the quantity of implantation steps increases in the process flow of base components, which requires improving productivity, junction depth have to be reduced year after year in order to answer to the general component dimension reduction. These constraints become real blocking point for Beam Line technology, and one of the most promising alternatives appears to be Plasma Immersion Ion Implantation. Already used in production for DRAM applications, PIII presents the huge advantage of high productivity, showing in the same time physical advantages for several applications. We propose to explore the benefits and limitations of plasma immersion ion implantation for current and advanced devices in the semiconductor industry, through the PULSION tool developed by IBS. Examples are shown on planar and 3D transistors (FinFET...).

**Keywords:** Plasma immersion ion implantation, semiconductor, planar, FinFET

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\*Speaker

†Corresponding author: yohann.spiegel@ion-beam-services.fr