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**Distributed mini ECR discharges for large plasma or beam generation**Pascal SORTAIS<sup>1</sup>, Thierry Lamy<sup>1</sup>, Jérôme Médard<sup>1</sup><sup>1</sup>LPSC, GRENOBLE, France

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We have developed a new approach to large plasma and broad beam generation. It consists in the use of very small (3 per 3 cm) individual ECR discharge working at very low power (typically some W) so that each discharge is activated by a low cost and compact solid-state transmitter (generally 10 W max). This device has been called COMIC (COmpact Microwave and Coaxial). Each individual discharge can produce typical 2.4GHz plasma and can be used as an ion source producing up to 10 mA/cm<sup>2</sup> at 5 W and up to 30 KV. We will present the main characteristics of this type of small device designed for plasma or ion source.

Concerning the generation of an arbitrary size or shape of plasma or ion beam, we will show that it is possible to associate together an arbitrary large number of individual small discharges. Each discharge shares the magnetic field generation magnets in order to maintain a very compact and high brightness system. We will present the main characteristics of the initial prototype that can work with up to 41 discharges distributed over a 15 cm per 15 cm square (so 41 transmitters). This machine totally works under vacuum. Thus it can be placed and moved to an arbitrary distance of the substrate to be treated.

With such geometry we can use a grid extractor for large beam production (sputtering and cleaning below 2 KV), a slit extractor for ribbon beam extraction, or one individual beam per discharge (up to 30 KV) generating by the way a so-called multi beam implanter (ion implantation, nitration).

**Keywords**

microwave

discharge

ECR

implantation

broad beam