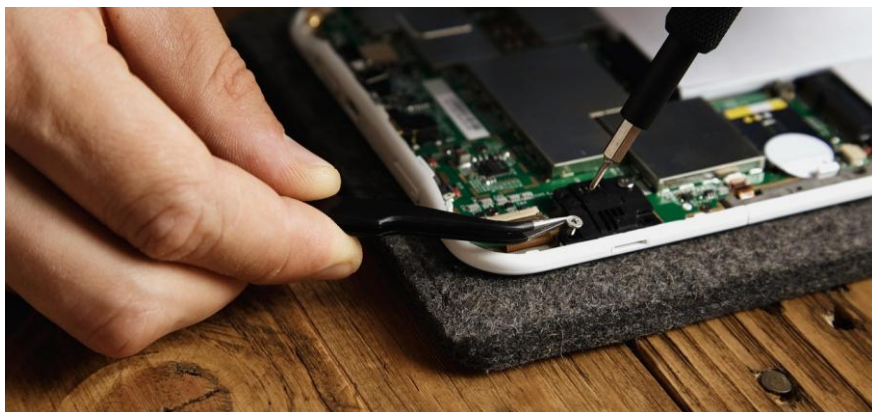


Technology Offer

CSIC/AI/014

## Rotating system for ion implantation in microstructured materials



**Rotary system that allows homogeneous ion implantation on surfaces of microstructured materials. The device avoids the shadows generated when tilting samples during the process, achieving a uniform distribution of impurities.**

### Intellectual Property

Priority patent application filed.

### Stage of development

Laboratory-tested prototype.

### Intended Collaboration

Licensing and/or co-development

### Contact

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### Market need

To manufacture advanced semiconductor materials, it is necessary to introduce impurities through a process called ion implantation. During this process, samples must be tilted by approximately 7 degrees to prevent ions from channelling through the crystal lattice. However, when the material surface has microstructures, this fixed tilt causes shadowing effects: parts of the sample remain hidden from the ion beam and do not receive the dopant uniformly.

Current systems do not adequately solve this problem. Therefore, the market needs a device that enables uniform implantation in this type of material, thereby improving the quality of advanced semiconductors.



### Proposed solution

A rotating system has been developed that couples to existing ion implanters. The device features a sample holder that rotates while maintaining the fixed 7-degree tilt. Rotation is transmitted from an external motor through a magnetic coupling that preserves the vacuum inside the chamber.

The rotation speed is slower than the ion beam scanning speed, ensuring that the entire microstructured surface is uniformly exposed. An additional metal plate collects ions that do not impact the sample, allowing precise measurement of the implantation dose.

### Competitive advantages

- Eliminates shadowing and guarantees uniform implantation on microstructured surfaces.
- Couples to conventional ion implantation equipment without modifications.
- Transmits rotation while maintaining vacuum through a sealed magnetic coupling.
- Measures implantation dose in real time with an ion-collecting plate.