

Abstract Submitted
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Practical helicon sources using permanent magnets FRANCIS F. CHEN, UCLA — Helicon sources are known for efficient conversion of RF energy into plasma density, but the need for a large electromagnet has impeded commercial acceptance. A novel use of permanent magnets, in which the plasma is placed below, rather than inside, a ring magnet allow the plasma to be ejected toward the substrate. The dimensions of a single source and its magnet have been optimized by computation and tested experimentally. For large area coverage, a multiple-source array has been designed and tested. In this case, RF circuitry and coupling present problems that have been solved. Measurements show that an 8-tube module should produce $10^{12}/\text{cm}^3$ density 7" below a source only 6" in height with 2-3% uniformity. Stacked modules can cover arbitrarily large substrates with this new paradigm.

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