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**DESIGN OF HIGH DENSITY PLASMA SOURCES
FOR MATERIALS PROCESSING**

by

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Memorandum No. UCB/ERL M93/3

11 January 1993

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DESIGN OF HIGH DENSITY PLASMA SOURCES FOR MATERIALS PROCESSING

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ABSTRACT

In this review article, we focus on recent advances in plasma source technology for materials processing applications. The motivation behind new source development is discussed along with the limitations of conventional radio frequency diode systems. Then the fundamental principles underlying electron heating in electron cyclotron resonance, helicon wave, inductively coupled, helical resonator, and surface wave plasmas are discussed with some attention to design issues. The transport of ions to device wafers and its influence on etching anisotropy is discussed for all sources. Similarly, we examine the benefits of using high density sources for minimizing plasma process induced damage and discuss in particular, the effects of plasma uniformity on charging damage.

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