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Time evolution of spatial RF field profiles in a 100 MHz reactor BARTON LANE, Tokyo Electron America, IKUO SAWADA, Retired, PETER VENTZEK, COLIN CAMPBELL, Tokyo Electron America, AKIRA KOSHIISHI, Tokyo Electron Miyagi — We report here on time and space resolved magnetic and electric field strength measurements in a 100 MHz reactor. The reactor studied is a test bed reactor with a geometry which approximately mimics commercial reactors for semiconductor manufacturing. The magnetic fields were captured using a B-dot probe fashioned after the work of Miller et al. [1] Time traces at different radial locations are compared using time traces from a fixed pickup probe mounted on the VHF feed in order to obtain magnetic field profiles as a function of radius at different values of the VHF phase. The presence of standing waves and propagating waves are clearly seen. A rapid increase and collapse of the magnetic field at the core of the plasma takes place on a nsec time scale showing the physical origin of the higher harmonic waves seen in previous studies. The profiles show the effect of the non-linear evolution of the wave. The data is presented as an animated sequence of plots of the field strength vs radius. A double dipole probe was also used to measure the vertical component of the VHF field. These measurements confirm the picture given by the B dot probe.

[1] Miller, Barnat, Hebner, Paterson, Holland, Plasma Sources Sci. Tech. **15** (2006)889-899.

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