

アンテナスイッチング法によるマイクロ波干渉計の多チャンネル化

Multichannelization of microwave interferometer by antenna-switching technique

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This presentation provides a simple and powerful technique for realizing multichannel measurement with microwave interferometry for density profile measurement in laboratory plasmas. The technique makes use of electromechanical microwave switches to temporally switch connection between multiple receivers and one phase detection circuit. Figure 1 shows the schematic of the multichannel interferometer system. The phase information detected at different positions is rearranged to data in time-series that can be

acquired by minimum number of data acquisition channels (e.g. two channels in case of quadrature detection). The developed multichannel microwave interferometer using the antenna-switching method was successfully applied to measure the radial electron density profiles in the magnetized plasma experiment. The advantage of the proposed method is the compactness and scalability to multi-dimensional measurement systems at low cost.

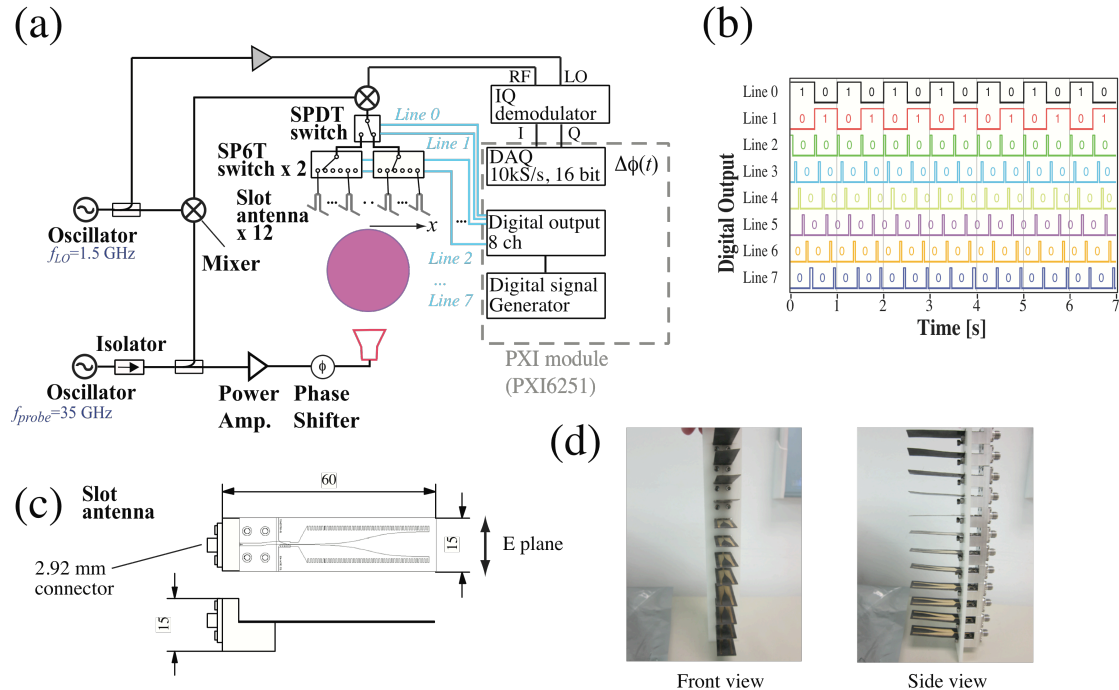


Fig. 1 (a) Schematic of the multichannel interferometer system with antenna-switching system (MIASS), (b) waveforms of control signal of the microwave switches, (c) schematic of the slot antenna and (d) photographs of the antenna array.