SUMMARY

Investigations have been made on the evaluation of wall admittance of rectangular microstrip patch radiator. Real part of wall admittance is evaluated using the Plane Wave Spectrum approach. The imaginary part is determined from the knowledge of electric and magnetic stored energies and the effective increase in length due to the fringing of the fields.

Analysis of probe excited rectangular microstrip patch radiator is carried out by the application of transmission line theory. The expression for input impedance seen by a coaxial line feeding a probe exciting the patch radiator is obtained in terms of wall admittance, dielectric and conductor losses and feed-pin size. The input impedance is evaluated for the patch radiator excited in the mode for which there is no variation of fields along the radiating sides and there is a half cycle variation along the perpendicular direction. The effect of all higher order modes are also incorporated in the analysis. The computed results on input impedance are compared with the experimental results.

The same problem is analysed by using cavity model. The fields in the patch radiator are expressed as superposition of normal mode fields. The amplitude coefficients of the excited fields are obtained in terms of wall admittance.

conductor and dielectric losses and exciting current. Comparison between the theoretical and experimental results is presented.

Analyses are carried out to determine the resonant frequency and input impedance of circular microstrip patch radiator in presence of a centred conducting post. A comparison between the theoretical and experimental results on input impedance is presented.

Analysis is carried out to determine the resonant frequencies of different modes of circular microstrip patch radiator loaded with passive conducting posts symmetrically placed on the circumferance of a circle concentric with the patch radiator both in presence and absence of a centred conducting post. The input impedance of the structure seen by a coaxial line feeding a probe, placed inside and outside of the circle on which the posts are located, is evaluated in absence of the centred post. Computed results on input impedance taking the effect of radiation and other losses into account are presented.

Input impedance seen by a waveguide exciting a rectangular patch radiator through a slot cut in the common wall between the ground plane of the patch radiator and the broadwall of the waveguide is presented. The expression for input impedance is derived from a knowledge of self-reaction and discontinuity in modal voltage or current.