Abstracts

Suspended resonators for filters-reduced /spl lambda//sub g/ excitation of evanescent cavities using high dielectric constant feedlines (2002 Vol. III [MWSYM])

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A structure consisting of dielectric-loaded feed lines (such as surface wave lines similar to Goubau lines) and below-cutoff air-filled cavities can be used to form essentially L-C sections. The capacitance is due to electric field coupling from the feed line dielectric medium into the below-cutoff section. The inductance results from combining the inductors in the inductive tee-equivalent circuit for such below-cutoff sections. Dielectric loading is used to shorten the guide wavelength at the input to the evanescent section, increasing the effective input inductance. The dielectrically-loaded feed lines can comprise microstrip, CPW, CPS, Goubau lines (surface wave structures), waveguide, etc. The resulting resonant elements are usable at frequencies below 1 GHz, with small dimensions. If connected to the common ground plane, these L-C sections act as a transmission zero. If "floated", i.e. connected in the "hot" line rather than to the ground plane, the sections form bandpass circuits (transmission poles). The air-filled below-cutoff sections (evanescent mode) are placed in a supporting low-dielectric constant medium (air, Teflon or similar), with the open end in proximity to the dielectric portion of the feed line, and are thus termed "suspended".

❑ Return to main document.