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High Q RF Resonant Cavity for Detecting Biological Tissue Nonlinearities VILDANA HODZIC, Department of Electrical and Computer Engineering, Univ. of Maryland, ROBERT W. GAMMON, IPST, Univ. of Maryland, QUIRINO BALZANO, CHRISTOPHER C. DAVIS, Department of Electrical and Computer Engineering, Univ. of Maryland — To investigate whether biological cells exhibit nonlinearity in the radiofrequency (RF) region, a high quality factor resonant cavity has been built. The cavity is fitted with two loop antennas, one transmitting at 880-890 MHz and a second one receiving at 1760-1790 MHz. The antenna operating at the low frequency (LF) band actively excites the TE_{111} cavity mode; the high frequency antenna must receive the energy of the TE_{113} mode at twice the frequency of the LF antenna. The cavity and the two antennas have been built. The Q of the cavity is over 6000 for both the frequencies of operation. Experiments to detect nonlinear RF frequency conversion by biological tissue can be performed using this high quality factor device.

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