FASSST RING DOWN SPECTROSCOPY: A NEW APPROACH TO CONTINUUM MEASUREMENTS IN THE MICROWAVE

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Microwave spectroscopy has ordinarily used the relative narrowness of Doppler broadened lines to separate spectral resonances from broader variations in the system power. However, there are a number of important phenomena, including those associated with the atmospheric continuum, which require measurement of absolute absorptions of slowly varying phenomena. This is commonly accomplished by the measurement of cavity Q. We will describe an approach that alternatively measures the cavity losses by a measurement of the ring down time. This approach, combined with a FASSST system, makes possible the measurement of absorption in ¿5000 cavity modes over 100 GHz in a few seconds. These essentially simultaneous observation makes possible the observation and elimination of many classes of systematic errors.