Seminars

STAR
System and Theory for Astrochemical Research

Sala Azzurra
Palazzo della Carovana
Scuola Normale Superiore
Palazzo dei Cavalieri, 7 - Pisa

25 JULY 2018 | h 11.00

Dual Excitation-Emission Propagation (DEEP) IMPACT & Monolytic COBRA-FTMW Spectrometers: Microwave Spectroscopic Studies in Jets (and of Flames)

ABSTRACT

The in-phase/quadrature phase modulation passage-acquired coherence technique (IMPACT) Fourier-transform microwave (FT-MW) spectrometer utilizing two off-axis parabolic reflectors delivers broadband capabilities at a spectral resolution similar to the resolving power of the narrowband but more sensitive coaxial beam-resonator arrangement (COBRA) FT-MW spectroscopy. Nevertheless, weakly polar molecules were difficult to study. The polarization capability could be significantly increased by rotating of the field vector direction of the linearly polarized microwave radiation. The setup prevails the high spectral resolution but increases the sensitivity dramatically while allowing the utilization of very high-power tube amplifiers. We present the apparatus as well as experimental results for the detection of reactive combustion intermediates produced in a home-built flat flame burner obtained with the a COBRA FT-MW spectrometer that also adopts instrumental aspects of the IMPACT FT-MW technique.

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