DDS-BASED FAST SCAN SPECTROMETER

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The technique of direct digital synthesis (DDS) has two important features which enable its application in microwave spectroscopy: micro-Hz tuning resolution and extremely fast frequency switching with continuous phase. We have applied a direct digital synthesizer in a PLL-spectrometer based on backward-wave oscillator (BWO). As result we have obtained an instrument that can cover a 100 GHz bandwidth in less than one hour with high spectral resolution and high precision of frequency measurement. The application of the spectrometer to sub-millimeter wave survey spectra records of several isotopic species of astrophysical molecules (methanol, formamide, methyl formate, aziridine) will be discussed.

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