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Nota di contenuto	Frequency Standards Basics and Applications; Contents; Preface; 1 Introduction; 1.1 Features of Frequency Standards and Clocks; 1.2 Historical Perspective of Clocks and Frequency Standards; 1.2.1 Nature's Clocks; 1.2.2 Man-made Clocks and Frequency Standards; 2 Basics of Frequency Standards; 2.1 Mathematical Description of Oscillations; 2.1.1 Ideal and Real Harmonic Oscillators; 2.1.2 Amplitude Modulation; 2.1.3 Phase Modulation; 2.2 Oscillator with Feedback; 2.3 Frequency Stabilisation; 2.3.1 Model of a Servo Loop; 2.3.2 Generation of an Error Signal; 2.4 Electronic Servo Systems 2.4.1 Components 2.4.2 Example of an Electronic Servo System; 3 Characterisation of Amplitude and Frequency Noise; 3.1 Time-domain Description of Frequency Fluctuations; 3.1.1 Allan Variance; 3.1.2 Correlated Fluctuations; 3.2 Fourier-domain Description of Frequency Fluctuations; 3.3 Conversion from Fourier-frequency Domain to Time Domain; 3.4 From Fourier-frequency to Carrier-frequency Domain; 3.4.1 Power Spectrum of a Source with White Frequency Noise; 3.4.2 Spectrum of a Diode Laser; 3.4.3 Low-noise Spectrum of a Source with White Phase Noise; 3.5 Measurement Techniques

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3.5.3 Aliasing; 3.6 Frequency Stabilization with a Noisy Signal; 3.6.1  
Degradation of the Frequency Stability Due to Aliasing; 4 Macroscopic  
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4.1.1 Basic Properties of Piezoelectric Materials; 4.1.2 Mechanical  
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Cylindrical Wave Guides; 4.2.3 Cylindrical Cavity Resonators  
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Atoms and Molecules; 6.1 Storage of Atoms and Molecules in a Cell;  
6.2 Collimated Atomic and Molecular Beams  
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#### Sommario/riassunto

Of all measurement units, frequency is the one that may be determined with the highest degree of accuracy. It equally allows precise measurements of other physical and technical quantities, whenever they can be measured in terms of frequency. This volume covers the central methods and techniques relevant for frequency standards developed in physics, electronics, quantum electronics, and statistics. After a review of the basic principles, the book looks at the realisation of commonly used components. It then continues with the description and characterisation of important frequency standards

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Sommario/riassunto	The use of scientific computing tools is currently customary for solving problems at several complexity levels in Applied Sciences. The great need for reliable software in the scientific community conveys a continuous stimulus to develop new and better performing numerical methods that are able to grasp the particular features of the problem at hand. This has been the case for many different settings of numerical analysis, and this Special Issue aims at covering some important developments in various areas of application.