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Introduction

We have seen some examples of discrete-time signals two lessons ago. This lecture is devoted entirely to a type of signal that will play a fundamental role in many topics to come, from Fourier analysis to data modulation and filtering: the complex exponential.

The complex exponential describes in compact form an oscillatory behavior with a given frequency and an initial phase; the complex-valued notation is both convenient and practical and is the standard in digital signal processing. The only caveat is that, in discrete time, the concept of frequency becomes a bit tricky because of a phenomenon called "aliasing".

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