Variabilidade em Quasares

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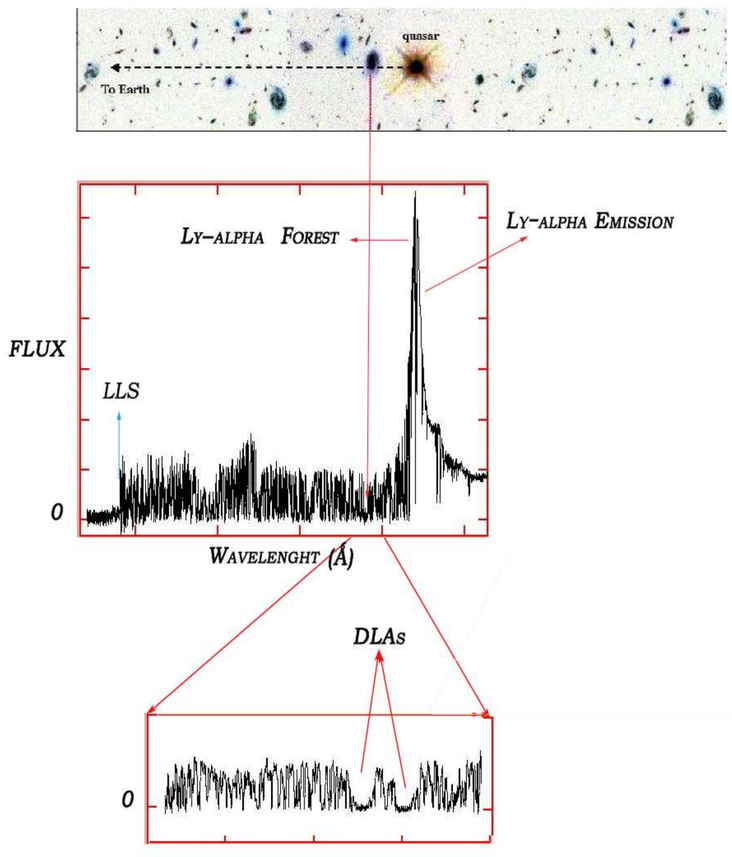
ABSTRACT

In recent years, there has been a growing evidence that many complex physical, economical, and biological systems manifest self-affinity characterized by long-range power-law correlations.

In such context, the "Detrended Fluctuation Analysis" (DFA) was recently proposed to analyze long-range power-law correlations in nonstationary systems. One advantage of the DFA method is that it allows the long-range power-law correlations in signals with embedded polynomial trends that can mask the true correlations in the fluctuations of a noise signal. The DFA method has been applied to analyze DNA and its evolution, file editions in computer diskettes, economics, climate temperature behavior, phase transition, astrophysics sources and cardiac dynamics, among others.

In this work the DFA method was applied to investigate self-affinity presented in the "Lyman Alpha Forest".

The Lyman Alpha Forest



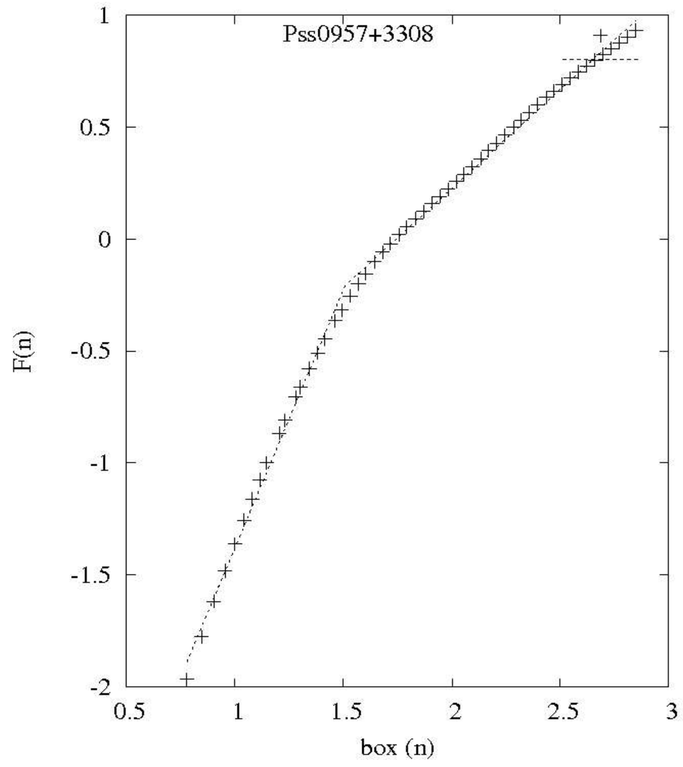
Spectrum of PSS J0747+4434(z = 4.42), showing the QSO continuum , absorption and emission lines produced by galaxies and intergalatic material that are between the QSO and observer.

The Lyman ? absorption lines of the Lyman Alpha Forest seen in the spectra of distant quasars are a powerful probe of the physical conditions in the Intergalactic Medium (IGM) at high redshifts (1.8 < z < 6.3).

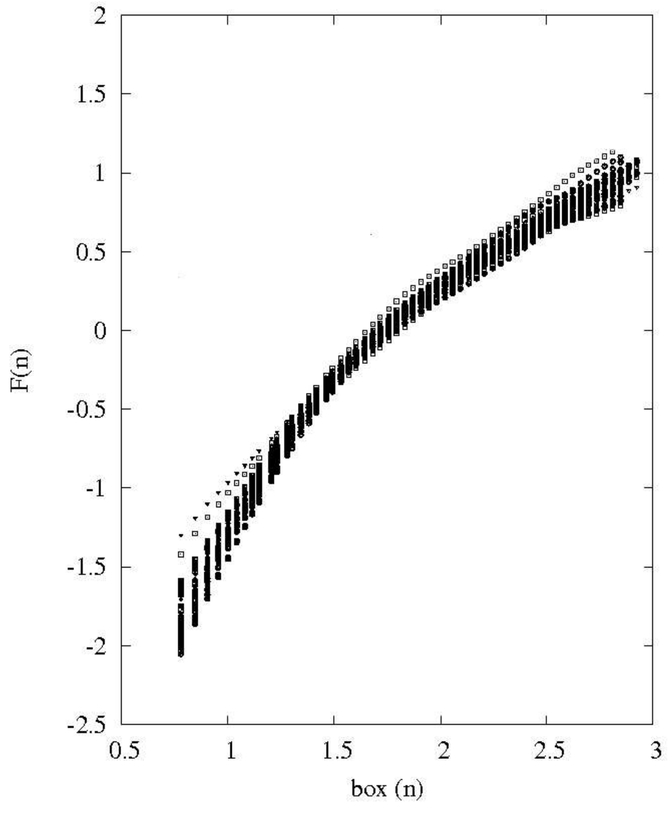
QSO Spectra DFA analysis

The KECK data

Individual Spectrum

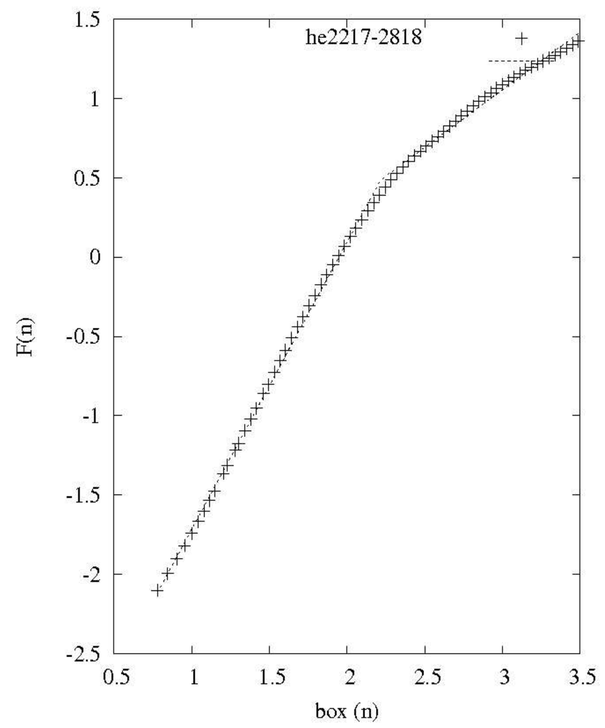


All KECK Spectra



The UVES data

Individual Spectrum



All UVES Spectra