

## Accepted Manuscript

Record length requirement of long-range dependent teletraffic

Ming Li

PII: S0378-4371(16)31048-2

DOI: <http://dx.doi.org/10.1016/j.physa.2016.12.069>

Reference: PHYSA 17871

To appear in: *Physica A*

Received date: 25 August 2016

Revised date: 12 November 2016

Please cite this article as: M. Li, Record length requirement of long-range dependent teletraffic, *Physica A* (2016), <http://dx.doi.org/10.1016/j.physa.2016.12.069>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



**Record length requirement of long-range dependent teletraffic**Ming Li<sup>1,2</sup><sup>1</sup> Ocean College, Zhejiang University, Zhejiang 316021, P. R. China<sup>2</sup> Sch Infor Sci & Tech, East China Normal University, Shanghai 200241, P. R. China

Emails: ming\_lihk@yahoo.com, mli@ee.ecnu.edu.cn, mli15@zju.edu.cn

URL: <http://orcid.org/0000-0002-2725-353X>

**Abstract:** This article contributes the highlights mainly in two folds. On the one hand, it presents a formula to compute the upper bound of the variance of the correlation periodogram measurement of teletraffic (traffic for short) with long-range dependence (LRD) for a given record length  $T$  and a given value of the Hurst parameter  $H$  (Theorems 1 and 2). On the other hand, it proposes two formulas for the computation of the variance upper bound of the correlation periodogram measurement of traffic of fractional Gaussian noise (fGn) type and the generalized Cauchy (GC) type, respectively (Corollaries 1 and 2). They may constitute a reference guideline of record length requirement of traffic with LRD. In addition, record length requirement for the correlation periodogram measurement of traffic with either the Schuster type or the Bartlett one is studied and the present results about it show that both types of periodograms may be used for the correlation measurement of traffic with a pre-desired variance bound of correlation estimation. Moreover, real traffic in the Internet Archive by the Special Interest Group on Data Communication under the Association for Computing Machinery of US (ACM SIGCOMM) is analyzed in the case study in this topic.

**Keywords:** Teletraffic, long-range dependence, correlation/spectrum measurement, Generalized Cauchy process, fractional Gaussian noise, record length requirement.

**PACS:** 02.50Ey; 05.45Tp

Download English Version:

<https://daneshyari.com/en/article/5103155>

Download Persian Version:

<https://daneshyari.com/article/5103155>

[Daneshyari.com](https://daneshyari.com)