

TESTS OF FIT FOR THE RAYLEIGH DISTRIBUTION BASED ON THE EMPIRICAL LAPLACE TRANSFORM

SIMOS MEINTANIS¹ AND GEORGE ILIOPOULOS²

¹*Department of Engineering Sciences, University of Patras, 261 10 Patras, Greece*

²*Department of Mathematics, University of the Aegean, 83 200 Samos, Greece*

(Received September 10, 2001; revised March 4, 2002)

Abstract. In this paper a class of goodness-of-fit tests for the Rayleigh distribution is proposed. The tests are based on a weighted integral involving the empirical Laplace transform. The consistency of the tests as well as their asymptotic distribution under the null hypothesis are investigated. As the decay of the weight function tends to infinity the test statistics approach limit values. In a particular case the resulting limit statistic is related to the first nonzero component of Neyman's smooth test for this distribution. The new tests are compared with other omnibus tests for the Rayleigh distribution.

Key words and phrases: Rayleigh distribution, goodness-of-fit test, empirical Laplace transform, smooth test.