

**Meeting:** 1001, Evanston, Illinois, SS 22A, Special Session on Special Functions, Orthogonal Polynomials, and their Applications

1001-33-16            **Slobodan B. Trickovic\*** (sbt@mail.gaf.ni.ac.yu), Faculty of Civil Engineering, Beogradska 14, 18000 Nis, Serbia, Yugoslavia, and **Miomir S. Stankovic**, Faculty of Environmental Engineering, Carnojevica 10a, 18000 Nis, Serbia, Yugoslavia. *A new approach to the orthogonality of the Laguerre and Hermite polynomials.*

This paper draws on results from [2], where we considered the orthogonality of rational functions  $W_n(s)$  which are obtained as the images of the classical orthogonal polynomials under the Laplace transform. We proved in [2] that the orthogonality relations of the Jacobi polynomials  $P_n^{(\alpha,\beta)}(x)$  and the standard Laguerre polynomials  $L_n(x)$  are induced by and are equivalent to the orthogonality of rational functions  $W_n(s)$ . In this article we continue in the same manner by considering the generalized Laguerre polynomials  $L_n^{(\alpha)}(x)$  and Hermite polynomials  $H_n(x)$ . In the last section we analyze the zeros distribution of the Laplace transform images of the Legendre, Chebyshev, Laguerre and Hermite polynomials.

#### References

- [1] H. Bateman, A. Erdélyi, *Higher Transcendental Functions*, Mc Graw-Hill Book Company Inc., New York-Toronto-London, 1953.
- [2] S.B. Tričković, M.S. Stanković, *On the Orthogonality of Classical Orthogonal Polynomials*, Int. Trans. Spec. Func. **14**, No 3 (2003) 271-280. (Received May 22, 2004)