1067-33-1452 **Dimitar K. Dimitrov** and **Alagacone Sri Ranga*** (`ranga@ibilce.unesp.br`), Universidade Estadual Paulista, Campus de Sao Jose do Rio Preto, S.J. do Rio Preto, SP, 15054-000, Brazil.
Szegő polynomials and para-orthogonal polynomials associated with hypergeometric functions. Preliminary report.

With $\mathcal{R}e(b) > -1/2$ (also assuming $b \neq 0$), we consider the sequences of hypergeometric polynomials $\{R_m(b;z)\}$ and $\{S_m(b;z)\}$ given by $R_m(b;z) = {}_2F_1(-m, b; b+\bar{b}; 1-z)$ and $S_m(b;z) = {}_2F_1(-m, b+1; b+\bar{b}+1; 1-z)$. It was shown recently that $\{S_m(b;z)\}$ is the sequence of Szegő polynomials (i.e. orthogonal polynomials on the unit circle) with respect to the positive weight function $w(b;\theta) = e^{-\theta\,\mathcal{I}m(b)}[\sin(\theta/2)]^{2\mathcal{R}e(b)}$ and that $\{R_m(b;z)\}$ form a special sequence of para-orthogonal polynomials with respect to these Szegő polynomials. These results were proved using the theory of continued fractions and three term recurrence relations. From the theory of Szegő polynomials and para-orthogonal polynomials, the zeros of $S_m(b;z)$ are within the unit disk and the zeros of $R_m(b;z)$ are distinct and lie on the unit circle. The objective here is to consider further relations between these polynomials and their implications and also consider their connections to other known orthogonal polynomials in the literature. The real second order differential equations associated with the functions $g_m(x) = (4z)^{-m/2}R_m(z)$, where $2x = z^{1/2} + z^{-1/2}$, are also looked at. (Received September 21, 2010)