Szegő polynomials and para-orthogonal polynomials on the real line, and the associated continued fractions.

We say that the strong positive measure $\psi$, defined on $[a, b]$, belongs to the symmetric class $S^3[\tau, \beta, b]$ if

$$
d\psi(t) = -\frac{d\psi((\beta^2/t)^{\tau})}{(\beta^2/t)^{\tau}},
$$

$t \in [a, b]$, where $0 < \beta < b$, $a = \beta^2/b$ and $2\tau \in \mathbb{Z}$. We let, without any loss of generality, $\beta = 1$ and consider the polynomials $S^\psi_n$ defined by

$$
\int_a^b t^{-s} S^\psi_n(t)d\psi(t) = 0, \; s = 0, 1, \ldots, n - 1.
$$

The polynomials $S^\psi_n$ can be called the monic Szegő polynomials on the positive interval $[a, b]$. We consider a study of the special PC-fraction

$$
\beta_0 - \frac{2\beta_0}{1 - \delta_1 z} - \frac{(\delta_1^2 - 1)z}{\delta_1} - \frac{1}{\delta_2 z} - \cdots.
$$

where $\delta_n = (-1)^n \tilde{\delta}_n > 1$, $n \geq 1$. The numbers $\tilde{\delta}_n = S^\psi_n(0)$, play the role of reflection coefficients. We also look at the properties of the para-orthogonal polynomials $S^\psi_n + \tau S^\psi_n^*$, where $\tau = \pm 1$. (Received September 23, 2005)