

**Meeting:** 1003, Atlanta, Georgia, SS 31A, AMS-SIAM Special Session on Integrable Systems and Special Functions, I

1003-33-154      **Yang Chen\*** (y.chen@ic.ac.uk), Department of Mathematics Imperial College, 180 Queen's Gate, SW7 2BZ London, England. *Orthogonal Polynomials with Discontinuous Weights: An Example on Painleve IV.*

In this talk I will describe how discontinuities introduced into otherwise smooth weights modify a pair of compatibility conditions first derived for smooth weights,  $w_0(x)$ . If  $w_0(x) = \exp(-x^2)$ , the Hermite weight, and

$$w(x) := w_0(x)(1 - \beta/2 + \beta\theta(x - t)), \quad -2 < \beta < 2$$

then  $\alpha_n(t)$  the diagonal recurrence coefficient of the monic polynomials orthogonal with respect to  $w$  over  $\mathbf{R}$  solves a particular Painleve IV considered as a function of  $t$ . Asymptotic formulas for fixed  $t$  and  $n$  large are given. (Received August 13, 2004)