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)