1035-30-80 **Scot Paul Childress*** (`10goto10@math.ucr.edu`). *Canonical Products Over the Roots of Certain Dirichlet Polynomials.*

We define a (real) Dirichlet polynomial P of a complex variable s as an expression

$$P(s) = m_0 r_0^s + \cdots m_M r_M^s,$$

where the m_j's are nonzero complex numbers and $0 < r_M < \ldots < r_0$ are real numbers. Associated to a (real) Dirichlet polynomial P is its canonical product, G_P, given by

$$G_P(s) = s^h \prod_{P(\omega)=0} \left(1 - \frac{s}{\omega}\right) e^{s/\omega}$$

(h denotes the multiplicity of 0 as a root of P). We use the Diophantine approximation scheme and the *lattice/nonlattice* dichotomy, expounded in *Fractal Geometry and Complex Dimensions* (Lapidus, Van Frankenhuysen), to show that G_P defines an entire function and that if $Q_n \to P$ is a *lattice approximation* of P then, with some minor adjustment, $G_{Q_n} \to G_P$ uniformly on compact sets. Classical techniques in the theory of infinite products are employed to derive the factorization formula

$$P(s) = K_P e^{\kappa_P s} G_P(s)$$

for lattice polynomials. We apply the obtained canonical product convergence results to recover the same factorization formula for nonlattice polynomials. (Received July 16, 2007)