Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-11-256 **James G Mc Laughlin*** (`james.mclaughlin@trincoll.edu`), Math. Dept., Trinity College, 300 Summit St., Hartford, CT 06106-3100. *Symmetry and Specializability in the Continued Fraction Expansions of some Infinite Products.*

Let $f(x) \in \mathbb{Z}[x]$. Set $f_0(x) = x$ and, for $n \geq 1$, define $f_n(x) = f(f_{n-1}(x))$. We describe several infinite families of polynomials for which the infinite product

$$\prod_{n=0}^{\infty} \left(1 + \frac{1}{f_n(x)}\right) \tag{1}$$

has a *specializable* continued fraction expansion of the form

$$S_\infty = [1; a_1(x),\, a_2(x),\, a_3(x), \ldots], \tag{2}$$

where $a_i(x) \in \mathbb{Z}[x]$ for $i \geq 1$.

When the infinite product and the continued fraction are *specialized* by letting x take integral values, we get infinite classes of real numbers whose regular continued fraction expansion is predictable.

Under some simple conditions, all the real numbers produced by this specialization are transcendental. (Received September 03, 2004)