1116-R1-885 **Barbara A. Shipman*** (bshipman@uta.edu), **Patrick D. Shipman** and **Stephen P. Shipman**. *Orthogonal Systems in the Euclidean and Lorentzian Complex Planes.*

A standard course on complex analysis includes a study of conformal mappings of the complex plane to itself. The real and imaginary parts of such a mapping are conjugate harmonic functions; they satisfy the Laplace equation and the Cauchy-Riemann equations. Students see that conformal mappings send curves that intersect orthogonally into curves that again intersect orthogonally. Here orthogonality is measured with respect to the standard Euclidean dot product. Less familiar to undergraduates is the Lorentz inner product on the complex plane. Systems of curves that intersect Lorentz-orthogonally no longer look, in general, orthogonal in the Euclidean sense. But their geometry is surprisingly beautiful, and elegant in its formulation. Such systems arise from Lorentz-conformal transformations, whose real and imaginary parts satisfy the wave equation and a Lorentzian analog of the Cauchy-Riemann equations. From these simple equations, one obtains beautiful and varied Lorentz-orthogonal systems with different symmetries and structures. This work, joint with P. Shipman and S. Shipman, will bring to any course on complex analysis a new perspective on the geometry of complex functions, and one that has interesting connections in physics as well. (Received September 15, 2015)