1106-VL-1 **Erwin Suazo*** (esuazo@asu.edu), Physical Sciences, A-Wing — P.O. Box 871804, Tempe, AZ 85281, and **Primitivo B. Acosta-Humanez** and **Sergei K. Suslov**. *Riccati-Ermakov systems and closed solutions for the degenerate parametric oscillator.*

As a nice application of differential Galois theory we present how we can construct explicit solutions for the propagator for a generalized harmonic oscillator. This has applications describing the process of degenerate parametric amplification in quantum optics as well as light propagation in a nonlinear anisotropic waveguide. Our solutions are conditioned on solving nonlinear systems that we have called Riccati-Ermakov systems, and we show several examples of solutions of this kind of systems. Our solutions will be useful to test standard numerical methods used. Finally, using Riccati-Ermakov systems we show how we can construct soliton solutions for a nonautonomous nonlinear Schrödinger equation.

References:

[1] P. B. Acosta-Humanez and E. Suazo, Liouvillian propagators, Riccati equation and differential Galois theory, J. Phys. A: Math. Theor. 46 (2013) 45520. (Received April 16, 2014)