1113-45-22   **D. P. Dwiggins*** (`ddwiggns@memphis.edu`), Dept Mathematical Sciences, 373 Dunn Hall, Memphis, TN 38152. *Bivariate Convolution and a Bivariate Version of the Laplace Transform.*

A Volterra integral equation uses a bivariate function as the kernel of the integral operator, and associated with each kernel is a bivariate function called the resolvent. The resolvent equation, relating the kernel and resolvent, can be expressed using the operation of bivariate convolution, and this leads to a formal series solution for the resolvent. In the case where the kernel is of convolution type, the resulting convolution equation is solved using the method of Laplace transforms. We seek to handle the non-convolution case by generalizing the Laplace transform to one acting on bivariate functions. The question now is how bivariate convolution works under this transform, and whether this approach will lend new insight into the behavior of solutions to the integral equation. (Received June 01, 2015)