

1084-32-75

**R. Michael Range\*** (range@math.albany.edu), Department of Mathematics and Statistics,  
State University of New York at Albany, Albany, NY 12222. *A New Integral Kernel for Weakly  
Pseudoconvex Domains.*

*Given an arbitrary weakly pseudoconvex domain  $D$  in  $\mathbb{C}^n$  with smooth boundary  $bD$ , a suitable local modification of the Levi polynomial of a particular defining function is introduced to obtain a new Cauchy-Fantappi  kernel on  $bD \times D$ . While the new kernel is not holomorphic in the parameter  $z \in D$ , it does reflect the complex geometry and the Levi form of the boundary. Some estimates for the corresponding integral operator are discussed which show that the new kernel has better properties than the standard Bochner-Martinelli kernel. Consequently this kernel and its corresponding extensions to  $(p, q)$ -forms should provide useful new tools for complex analysis in this general setting. In particular, this leads to a **pointwise** basic estimate in the theory of the  $\bar{\partial}$ -Neumann problem on weakly pseudoconvex domains which is an analogon of the Kohn-Morrey basic estimate in the  $L^2$  theory. (Received August 22, 2012)*