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Mircea Martin* (mircea.martin@bakeru.edu), Department of Mathematics, Baker University, Baldwin City, KS 66006. *Generalized Cauchy-Pompeiu and Bochner-Martinelli-Koppelman Integral Representation Formulas*. Preliminary report.

We set up generalized Cauchy-Pompeiu and Bochner-Martinelli-Koppelman representation formulas for arbitrary pairs (\mathfrak{D}, Φ) , where \mathfrak{D} is a first-order homogeneous differential operator on \mathbb{R}^n with coefficients in a Banach algebra \mathfrak{A} , and Φ is a smooth \mathfrak{A} -valued function on $\mathbb{R}^n \setminus \{0\}$ homogeneous of degree $1 - n$, $n \geq 2$. Within our general framework we prove that the integral representation formulas include the expected components, as well as some remainders that are explicitly computed in terms of \mathfrak{D} and Φ . As a consequence, we obtain necessary and sufficient conditions that ensure the existence of genuine Cauchy-Pompeiu or Bochner-Martinelli-Koppelman formulas for (\mathfrak{D}, Φ) . These conditions prove valuable in investigating Dirac and Cauchy-Riemann operators. (Received September 18, 2010)