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PARTIAL DIFFERENTIAL OPERATORS MODULO SMOOTH FUNCTIONS

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ABSTRACT. For a constant coefficient linear partial differential operator $P(D)$ on $\mathscr{D}'(\Omega)$ we provide new characterizations when

$$\mathscr{D}'(\Omega) \times \mathscr{E}(\Omega) \to \mathscr{D}'(\Omega),\ (u, f) \mapsto P(D)u + f$$

is surjective and when it has a continuous linear right inverse. Both results are in the spirit of a celebrated result of Meise, Taylor, and Vogt who characterized right invertibility of $P(D)$ on $\mathscr{D}'(\Omega)$ by properties of fundamental solutions.