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The sum of a maximal monotone operator of type (FPV) and a maximal monotone operator with full domain is maximal monotone

The most important open problem in Monotone Operator Theory concerns the maximal monotonicity of the sum of two maximal monotone operators provided that Rockafellar's constraint qualification holds.

In this paper, we prove the maximal monotonicity of the sum of $A+B$ provided that A and B are maximal monotone operators such that $\operatorname{dom} A \cap \operatorname{int} \operatorname{dom} B \neq \varnothing$, $A + N_{\overline{\operatorname{dom} B}}$ is of type (FPV), and $\operatorname{dom} A \cap \overline{\operatorname{dom} B} \subseteq \operatorname{dom} B$. The proof utilizes the Fitzpatrick function in an essential way.