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Analytic P-ideals of $\mathcal{B}(H)^+_{\leq 1}$

Let H be a separable infinite dimensional complex Hilbert space and $\mathcal{B}(H)^+_{\leq 1}$ the set of positive operators on H of norm at most one. Considering $\mathcal{B}(H)^+_{\leq 1}$ as a Polish space with respect to the weak operator topology, we prove that certain analytic subsets of $\mathcal{B}(H)^+_{\leq 1}$ (that we call analytic P-ideals) are determined by lower semicontinuous submeasures on $\mathcal{B}(H)^+_{\leq 1}$. This result generalizes a theorem of S. Solecki for the poset $\mathcal{P}(\omega)/\operatorname{Fin}$.