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A new relationship between decomposability and convexity

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Abstract: In the present work we prove that, in the space of Pettis integrable functions, any subset that is decomposable and closed with respect to the topology induced by the so-called Alexiewicz norm $|||\cdot|||$ $\left(\text{where } |||f||| = \sup_{[a,b]\subset[0,1]} \left\| \int_a^b f(s)ds \right\|\right)$ is convex. As a consequence, any such family of Pettis integrable functions is also weakly closed.

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