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*Extension of vector valued holomorphic and harmonic functions*

We present a unified approach to study extensions of vector valued holomorphic or harmonic functions from the existence of weak or weak\*-holomorphic or harmonic extensions. Several recent results due to Arendt, Nikolski, Enflo, Smithies, Bierstedt, Holtmanns and Grosse-Erdmann are extended. An open problem posed by Grosse-Erdmann is solved in the negative. Using the extension results we prove existence of Wolff type representations for the duals of certain function spaces.