World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:16, No:04, 2022

On Boundary Values of Hardy Space Banach Space-Valued Functions

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Abstract : Let T be a unit circumference of a complex plane, E be a Banach space, E* and E** be its conjugate and second conjugate, respectively. In general, a Hardy space Hp(E), p ≥1, where functions act from the open unit disk to E, could contain a function for which even weak nontangential (angular) boundary value in the space E** does not exist at any point of the unit circumference T (C. Grossetete.) The situation is "better" when certain restrictions to the Banach space of values are applied (more or less resembling a classical case of scalar-valued functions depending on constrains, as shown by R. Ryan.) This paper shows that, nevertheless, in the case of a Banach space of a general type, the following positive statement is true: Proposition. For any function f(z) from Hp(E), p ≥ 1, there exists a function F(eiθ) on the unit circumference T to E** whose Poisson (in the Pettis sense) is integral regains the function f(z) on the open unit disk. Some characteristics of the function F(eiθ) are demonstrated.

Keywords : hardy spaces, Banach space-valued function, boundary values, Pettis integral
Conference Title : ICMCMMM 2022 : International Conference on Mathematics, Computational Methods and Mathematical Modelling
Conference Location : Boston, United States
Conference Dates : April 21-22, 2022