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THE DUAL SPACE OF A COMPLEX BANACH SPACE RESTRICTED TO THE FIELD OF REAL NUMBERS

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Abstract. Solutions of some partial differential equations are obtained as critical points of a real funtional. Then the Banach space where this functional is defined has to be real, otherwise, it is not differentiable. It follows that the equation is solved with respect to the real dual space of this Banach space. But if the solution is complex-valued there is the following problem: what does the multiplication of this equation by a complex number mean ? In this note, we explain how to rigorously define this operation.

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