

First Joint Meeting Brazil Italy of Mathematics  
Special Session: Topological and impulsive methods for  
the qualitative analysis of differential equations,  
differential inclusions and difference equations

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**Title:** Second order impulsive retarded differential inclusions with nonlocal conditions

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**Abstract:** When  $\mathbb{R}^k$  space is decomposed in the union of  $n \leq 4$  polyhedral cones (with nonempty interior and common vertex at the origin), our main result provides sufficient conditions for any map  $g$ , that is continuous and piecewise  $C^1$  relatively to this slicing, to be invertible. This result extend a previous one by the same authors valid for  $k = 2$ . It is proved by a combination of linear algebra and topological arguments. This is a joint work with Laura Poggiolini.