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A Mathematical Model to describe the dynamics of patent filing and innovation

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Resumo:

For the area of technology and innovation management, it is of fundamental importance to identify the level of maturity a given technology is. This information is of paramount importance for making decisions regarding investments in research and development. The dynamics of the number of patents deposited in a given technological scope allows us to infer at what stage this field is. If it is possible to predict the future scenario through mathematical models, this identification becomes more precise and therefore will improve the management of innovation and intellectual property. The present work presents a proposal for a mathematical model that uses concepts related to growth kinetics. Some technological fields linked to materials technologies are presented as case studies. Specifically, an example in the area of metallic, polymeric and ceramic materials will be analyzed and an analysis in the area of assisted manufacturing will be presented. With this, the present work will not only present a proposal for a model from the area of Materials Science applied in Innovation Management, but also presents some scenarios of technological maturation in the respective technological area. Curves that reproduce the behavior of the accumulated number of patents deposited in a given technological scope are obtained. The sigmoidal behavior allows us to clearly establish which stage the technology is in and allows us to predict how long this technology will be in a stage of maturity - important data for the decisions already mentioned. This work presents the curve fittings that allow to exemplify the method developed here and its applications in the area of Materials.