

Fractional dynamics and power law behaviour in soccer leagues

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Abstract: This paper addresses the dynamical analysis of the performance of soccer teams during a given league. The modeling perspective adopts the concepts of fractional calculus and power law. The proposed modeling approach embeds implicitly details such as the behavior of players and coaches, strategical and tactical maneuvers during the matches, errors of referees and a multitude of other effects. The scale of observation focuses on the teams behavior in the perspective of their classification along the league. Data characterizing two European soccer leagues are processed and discussed. The computational and mathematical modeling leads to the emergence of patterns that are analyzed and interpreted in the light of complex systems.

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