

MA202 Project

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Numerical simulations and stability analysis of a COVID-19 model using fractional derivatives

Problem Statement

The coronavirus spread can be mathematically modelled using factors such as the number of susceptible people, exposed people, infected people, asymptomatic people and the number of recovered people. The Khan-Atangana system is an integer-order coronavirus model that uses the above-mentioned factors. Since the coronavirus model depends on the initial conditions, the Khan-Atangana model cannot perfectly explain the virus spread due to the local nature of the integer-order derivative. Thus, we replace the equations with fractional-order derivatives. These give a better understanding of the model since they depend on the initial conditions and are non-local in nature. This project proposes to solve these fractional-order derivatives using numerical methods and analyse the stability of this epidemiological model.