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(57) Abstract :
 Abstract In this work, it provides a set of six novel predictor-corrector techniques for addressing FDEs of order $q = 1, 2, \dots, 6$, and Caputo's understanding, the nonlinear fractional operator is used. The method also offers a stability and error analysis of the suggested numerical method family. It also generalizes these strategies to solve FDE systems. We show the utility and efficiency of the suggested approaches by addressing various non-trivial non-linear FDEs as well as some unpredictable FDE systems. When compared to existing techniques such as FAM or NPCM, the hypothesized series of predictor-corrector methods produces good outcomes in significantly less time. The computing time is dramatically decreased, since they need only 10% of the overall time required with FAM and 20% of the total time required by NPCM. Even for very tiny values of the order of the fractional derivative operator, FBD-PCMq converges, whereas FAM and NPCM fail to converge. As a result, FBD-PCMq provides powerful tools for studying FODS.

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