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## Steady oscillations in kinetic model of aggregation process with collisional fragmentation

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In this work, we study a kinetic model of aggregation process with collisional fragmentation with use of two efficient implementations of numerical methods: direct simulation Monte Carlo and finite-difference scheme exploiting the low-rank matrix representations of the utilized kinetic coefficients. We concentrate our efforts on the analysis of the solutions for a particular class of non-local aggregation kernels

$K_{i,j} = i^a j^{-a} + i^{-a} j^a$ , with multiplicative expression for the fragmentation rates  $F_{i,j} = \lambda K_{i,j}$  with  $0 < \lambda \ll 1$ . For  $a > 0.5$  and  $\lambda < \lambda_c$  never-ending collective oscillations of the aggregates' concentrations take place [1].

The main contribution of this work is cross-validation of our previous observations with the utilization of the well-known stochastic acceptance-rejection method [2] and its modification to an accounting of the fragmentation events.

[1] Brilliantov N. V., Otieno W., Matveev S. A., Smirnov A. P., Tyrtysnikov E. E., Krapivsky P. L. (2018) // Steady oscillations in aggregation-fragmentation processes. *Physical Review E*, 98(1), 012109.

[2] Garcia A. L., Van Den Broeck C., Aertsens M., Serneels R. (1987) // A Monte Carlo simulation of coagulation. *Physica A: Statistical Mechanics and its Applications*, 143(3), 535-546.

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