

Combining a stroboscopic method with the spectral deferred correction method

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In natural sciences, problems with periodic forcings are studied often; for instance for an idealized ice cloud model the impact of gravity waves can be represented by such a forcing. Therefore, we implemented a new method for stroboscopic problems. For a first test, we chose the inverted Kapitsa pendulum equation which is an appropriate test problem for this kind of methods. Our numerical scheme is a combination of two existing methods. We used a stroboscopic method proposed by Calvo et al. (2011) and the method of spectral deferred correction. The first above-mentioned method consists of a micro-solver and a macro-solver. The method of spectral deferred correction is an iterative scheme and used as a macro-solver for the first method. The iterations of the spectral deferred correction method are used to increase the accuracy of the macro-solver.