High-Order-Compact ADI schemes for pricing basket options in the combination technique

Christian Hendricks (Bergische Universität Wuppertal), Christof Heuer, Matthias Ehrhardt, Michael Günther

In this work we combine high order compact (HOC) and alternating direction implicit (ADI) schemes for pricing basket options in a sparse grid setting. HOC schemes exploit the structure of the underlying partial differential equation to obtain a high order of consistency while employing a compact stencil. In the time discretisation we propose an efficient ADI splitting to derive a stable scheme. The combination technique is used to construct the so called *sparse grid* solution, which leads to a significant reduction of necessary grid points and therefore to a lower computational effort.