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Sommario/riassunto	<p>To increase the efficiency of energy-intensive industrial processes, thermal energy storages can offer new possibilities. In recent years, especially latent heat thermal energy storages, exploiting the high energy density of phase change material (PCM), are becoming widely applied in industry. A novel approach is investigated in the project HyStEPs, funded by the Austrian Research Promotion Agency (FFG) with grant number 868842. In this concept, containers filled with PCM are placed at the shell surface of a Ruths steam storage, to increase storage efficiency. In this work, a two-dimensional model using the finite element method is developed to simulate the PCM of the hybrid storage as designed in the HyStEPs project. The apparent heat capacity method is applied in a MATLAB implementation, considering heat transfer by both conduction and natural convection. This successfully validated code can handle any desired layout of materials arranged on a rectangular domain. Furthermore, a parameter study of different dimensions and orientations of the PCM cavity was conducted. The impact of natural convection was found to lead to significantly varying behaviour of the studied cavities with different orientation during the charging process, while it was found to be negligible during the</p>

discharging process.
