Space Heating And Ventilation Simulation For An Office Room

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Abstract

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In order to study thermal conditions and air flows in an office room, 3D FEM simulation model was created. The room is enclosed by walls, floor and ceiling which thermal characteristics are specified by typical heat transfer coefficients and specific heat capacities. Space heating is generated by an electric heater which control is based on an on/off-controller and a temperature sensor. Air ventilation is based on constant air flow which volumetric speed is set by the requirements of the national building code. Non-uniformity of room temperature and air conditioning cause discomfort of occupants and loose of energy efficiency. Multiphysics simulation combining thermal and CFD simulations reveals possible thermal imbalance and undesirable air flows in the room.