

Lothar-Collatz-Seminar

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Modelling and simulation of air flow dynamics inside termite mounds and passive houses

Abstract:

Termite mounds are complex animal-built structures with varied architectural designs depending on the species and respective habitats. One key function is to provide ventilation for the underground nest. This regulates the temperature of the nest and diffuses the metabolic gases produced inside. A one-dimensional mathematical model is presented that describes the airflow inside of a termite mound. It is derived from the Euler equations of gas dynamics. A low Mach number asymptotic analysis is performed. The ventilation system of a termite mound is simulated for a 24 hour day-night cycle. The analogies to a passive house are identified. This allows to adapt the model for passive houses. We perform simulations for typical winter day night cycles

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www.c3s.uni-hamburg.de/news-events/seminar-c3s.html

