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NUMERICAL SIMULATION OF BIOMIMETIC MATERIALS

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ABSTRACT

Biomimetic materials are an emerging class of materials that have the ability to adapt to their environment and to be more durable than conventional materials. Such materials have the potential to 'deliver major change, most noticeably in the built environment' as identified by the Royal Society [1]. An example of such a material is self-healing concrete that is designed to alleviate cracking related durability issues, reducing maintenance costs and cement usage (and associated CO_2 emissions). Numerical models are not only useful for the analysis of these biomimetic materials, but can also play a key role in their development, since once they have been calibrated they can explore large parameter spaces that would otherwise be impracticable [2].

This session invites contributions that concern the simulation of such materials, including mechanical response, transport properties, chemistry and other related aspects. Whilst the focus of the session is on construction materials, contributions concerning the simulation of other biomimetic materials are also encouraged.

REFERENCES

[1] The Royal Society, Animate materials. The Royal Society, London, UK, 2021

[2] Freeman BL, Jefferson AD, Numerical simulation of self-healing cementitious materials. In: Kanellopoulos A., Norambuena-Contreras J. (eds) Self-Healing Construction Materials. Engineering Materials and Processes. Springer, Cham., 2022