**Virtualizing Structural Health Monitoring data in digital twins of engineering structures**

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**Abstract.** Digital twins are virtual counterparts of real objects in their whole lifecycle. This concept gains popularity also in civil engineering. One of the uses of digital twins is monitoring and analyzing the condition of civil engineering facilities. Structural health monitoring (SHM) is, therefore, an important component of digital twinning, as it allows for acquiring data about a structure’s performance.

Civil engineering digital twins utilize also other modern civil engineering techniques. One of them is Building Information Modeling (BIM). Interoperable BIM models are a way to use SHM data in the virtual dimension to enhance the utilization of digital twins, e.g., optimization of design, maintenance planning, and data management.

This paper proposes a technique to integrate SHM data into the BIM environment. This approach opens new possibilities. BIM models, enhanced with continually updating SHM data, are realizing an idea of a model coexisting with an object. Moreover, the SHM data analyzed not in isolation, but enhanced with the semantic information from BIM models, can lead to a more complex understanding of the structures’ processes.

**Keywords:** SHM, digital twins, BIM, virtualization, data management