## Enhancement of product durability and usability for resource-efficient society

## Long-term sustainable use of composite materials by 5-D digital twin technology

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## Summary :

The long-term sustainable use of light-weight composite materials requires a new technology which is capable of accurately predicting the lifetime of composite structures in both design and operation stages. 5-D digital twin technology interacting with structural monitoring systems is to be developed to predict the log-term mechanical response of composite structures under fatigue loadings with significant accuracy. Microstructural fatigue damage mechanism should be taken into account in the meso-scale fatigue damage accumulation models to simulate the fatigue life and residual strength of composite materials. Structural monitoring system is combined with the numerical simulation to improve the prediction capability.



