

## Probabilistic Data Mining for Aircraft Structural Health Monitoring

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**Abstract:** Structural health monitoring for aircraft structures has gradually turned from fundamental research to practical implementations. However, numerous uncertainties arise from practical engineering such as time-varying loads and boundary conditions may have great effects on structural health monitoring signals, which make it difficult for reliable evaluation of structural damages. To deal with these uncertainties, probabilistic data mining methods are attracting more and more attention and gradually applied to aircraft structural health monitoring. Probabilistic data mining methods quantify effects of the uncertainties and the damage with probabilistic models, and perform reliable damage evaluation with diagnosis method. This paper aims at discussing probabilistic data mining methods in aircraft structural health monitoring, as well as their applications to aircraft structures in practical engineering taking advantages of the guided wave based structural health monitoring.

**Key Words:** *Probabilistic data mining, Structural health monitoring, Probabilistic damage diagnosis, Guided wave.*