

## **New Hybrid Carbon Fiber Sensor**

The research group at Ibaraki University led by Prof. Wu has developed out a new kind of hybrid carbon fiber (HCF) sensor with several types of continuous carbon fibers of different strengths and moduli. The sensor is characterized with excellent durability, with broad-based and distributed sensing functions. The electrical and mechanical models of the sensor are schematically shown in Figure 1(a). The measurement principle is based on micro- and macro-fractures of carbon fibers, as shown in Figure 1(b). In this model, three types of carbon fibers are involved: high modulus (HM), middle modulus (MM) and high strength (HS) carbon fibers. The hybridization is applied to obtain a step-wise increasing manner of electrical resistance (ER), designed to realize a stage health monitoring function for the real civil structures.

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