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Electro-mechanical self-sensing response of ultra-high-performance fiber-reinforced concrete in tension

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2 **reinforced concrete in tension**

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13 **Abstract**

14 The electro-mechanical self-sensing response of ultra-high-performance fiber-reinforced  
15 concretes (UHPFRCs), a type of strain-hardening steel-fiber-reinforced concretes (SH-SFRCs),  
16 in tension was investigated. The self-sensing capacity of SH-SFRCs was significantly enhanced  
17 by using ultra-high-performance concrete (UHPC) as the matrix. The high electrical resistance of  
18 UHPC noticeably increased the magnitude of the resistivity reduction of UHPFRCs in tension to  
19 437.7 k $\Omega$ -cm, compared to the lower values (13.7 and 149.1 k $\Omega$ -cm) of SH-SFRCs. UHPFRCs  
20 showed the highest gauge factor (433) until the first cracking point, whereas the SH-SFRCs with  
21 a 133 MPa compressive mortar matrix showed the highest gauge factor (73.7) within the strain-  
22 hardening region. An embedded copper wire mesh type electrode efficiently reduced the

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