

## **SURFACE TOPOGRAPHY PROGRESSION AS THE INITIATION OF THE EROSION ON THE LEADING EDGE OF WIND TURBINE BLADES**

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Abstract: The rain erosion on the leading edge of wind turbine blades has become a challenging engineering issue for the wind industry during the last decades. The raindrop impacts are the primary cause of surface erosion on the leading edges. These impacts start modifying the surface roughness, then changing the shape, i.e. the aerodynamic profile, of the leading edge and in the end damaging the integrity of the blade material. Being the damage initiation mechanism, this work has analysed the roughness evolution during the incubation period, i.e. when no erosion damage can be found. To establish a complete surface roughness progression, the behaviour of several roughness parameters, e.g., arithmetical mean height, skewness, etc., have been studied for five different coatings which are used as erosion protection on the wind turbine blades.

Keywords: Roughness, Erosion, Leading edge, Rain impact