Abstract:

Lightning damages on wind turbines are costly in terms of repair and replacement although they are equipped with adapted lightning protection systems. To assess and improve the lightning protection of WT blades, it is necessary to measure the lightning discharge and current flow phenomena. To achieve this objective, lightning impact monitoring and measurement systems are necessary, since they provide results which can be used for lifetime monitoring of components and preventive maintenance. A new lightning measurement and impact detection system has been developed to calculate lightning parameters for online condition monitoring. As defined in the technical report IEC 61024-1, the measured and calculated parameters are the peak current, the specific energy, the average rate of current rise, and the total charge. These values are used to classify the lightning into the four protection levels used for WT system development (Class I to IV).