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How Safe Should We Design the Wind Turbine for Hurricane?

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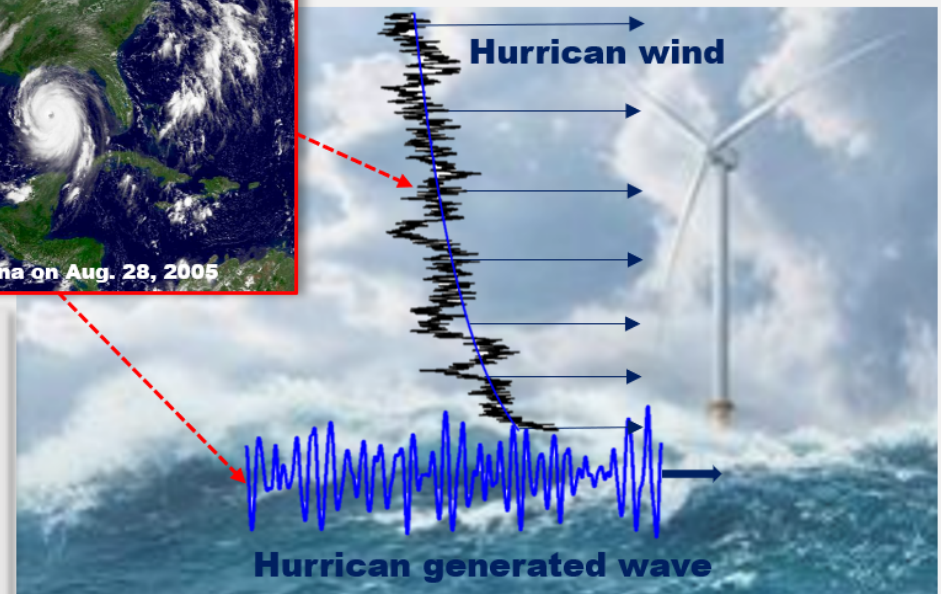
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How Safe Should We Design the Wind Turbine for Hurricane ?

Developing wind energy is a promising solution both to our energy demanding and carbon neutrality target. With the premium onshore land being much exploited, offshore wind is receiving attention.



However, many of those regions suffer from the potential devastating damage and economical loss imposed by the hurricane worldwide. A critical question arises: how safe should we design a wind turbine under hurricane conditions?



Three components are investigated for this question throughout my PhD research. First, the assessment of the hurricane-generated extreme wind and wave hazard for the site of interest is performed; Second, what is the failure probability of the designed wind turbine under such wind and wave hazard; finally, what is the optimal safety level to achieve the compromise of the economics and consequence of structure failure induced by the hurricane. Hope my research can provide some insights into this complicated problem based on comprehensive inter-discipline knowledge.