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## **1 Introduction and motivation Soni**

## **2 Controller design objectives**

### **2.1 Advanced Controller Soni**

### **2.2 Control Region Soni**

### **2.3 Generator Torque controller Soni**

### **2.4 Collective pitch controller CPC Julius**

### **2.5 Tower Damper Felix**

## **3 Further Things**

### **3.1 Windfield Generation Felix**

### **3.2 Storage model with scenario options Julius**

### **3.3 tower stiffness calculation Julius**

## **4 Controller tuning**

### **4.1 steady states**

### **4.2 DEL calculation thetaK Felix**

### **4.3 theta min static Julius**

0.5 deg

### **4.4 theta dynamic Julius**

not worth it

## **5 Challenges and Teamwork**

### **5.1 Generator speed and Region 2.5**

### **5.2 Rated wind speed**

### **5.3 Aerodynamics in FAST**

## **6 Summary**

### **6.1 Conclusion**

## 7 Appendix