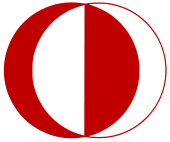
08.03.2020



**MIDDLE EAST TECHNICAL UNIVERSITY**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**EE 568** Project #1

***Torque in a Variable Reluctance Machine***

GÖKHAN ÇAKAL – **2332120**

# Q1) Analytical Modeling

Sıfır derece neresi göster

# Q2) FEA Modeling (2D – Linear Materials)

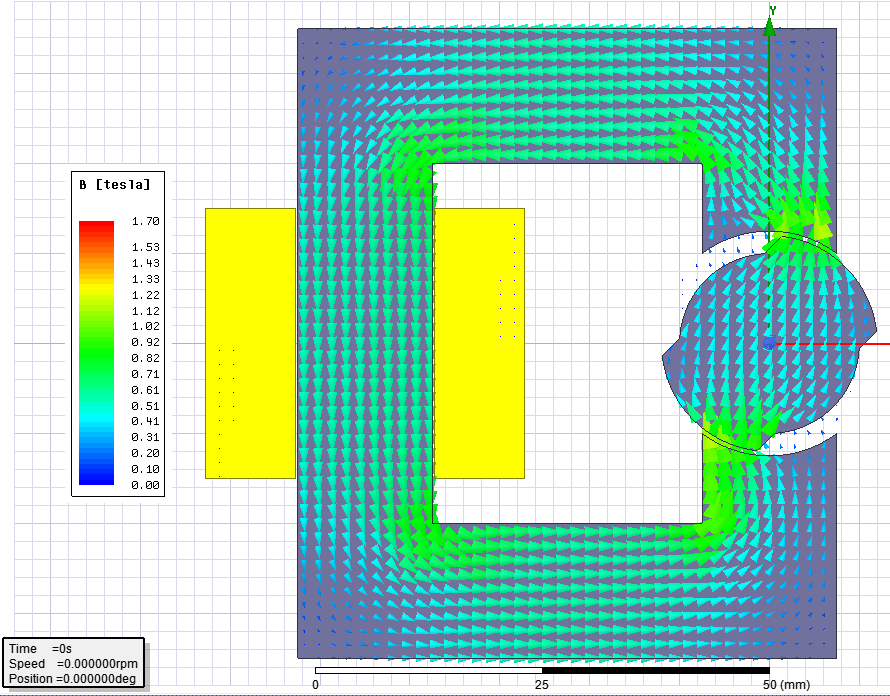


Figure 1: Flux density vector for linear material at -45 deg position

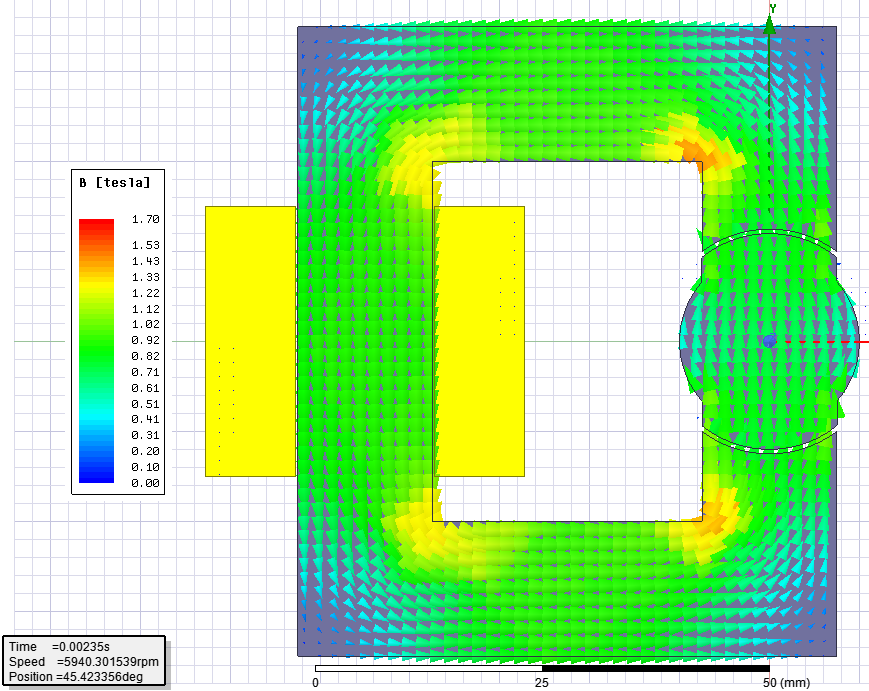


Figure 2: Flux density vector for linear material at 0 deg position

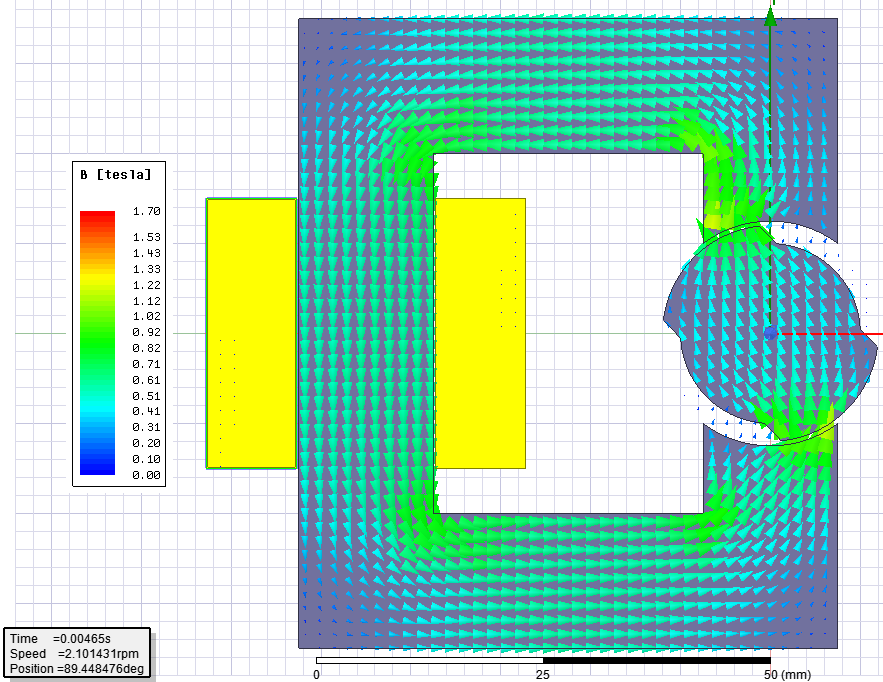


Figure 3: Flux density vector for linear material at -45 deg position

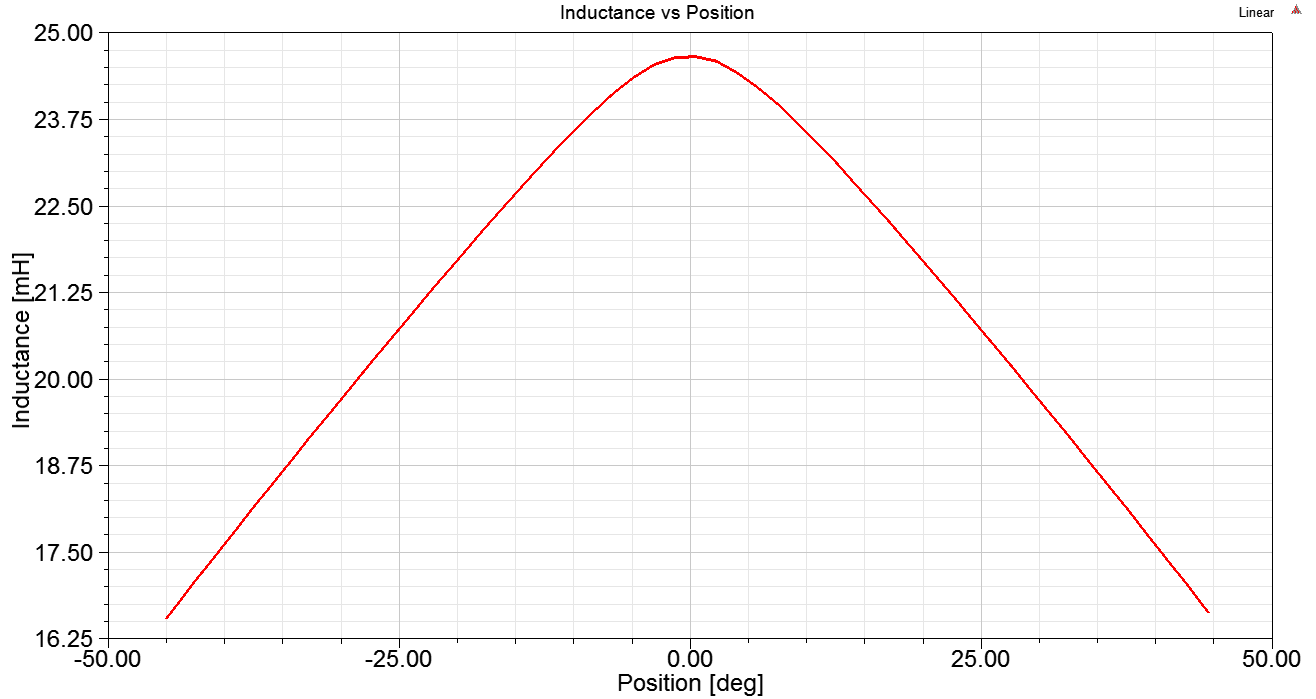


Figure 4: Inductance vs position for linear material

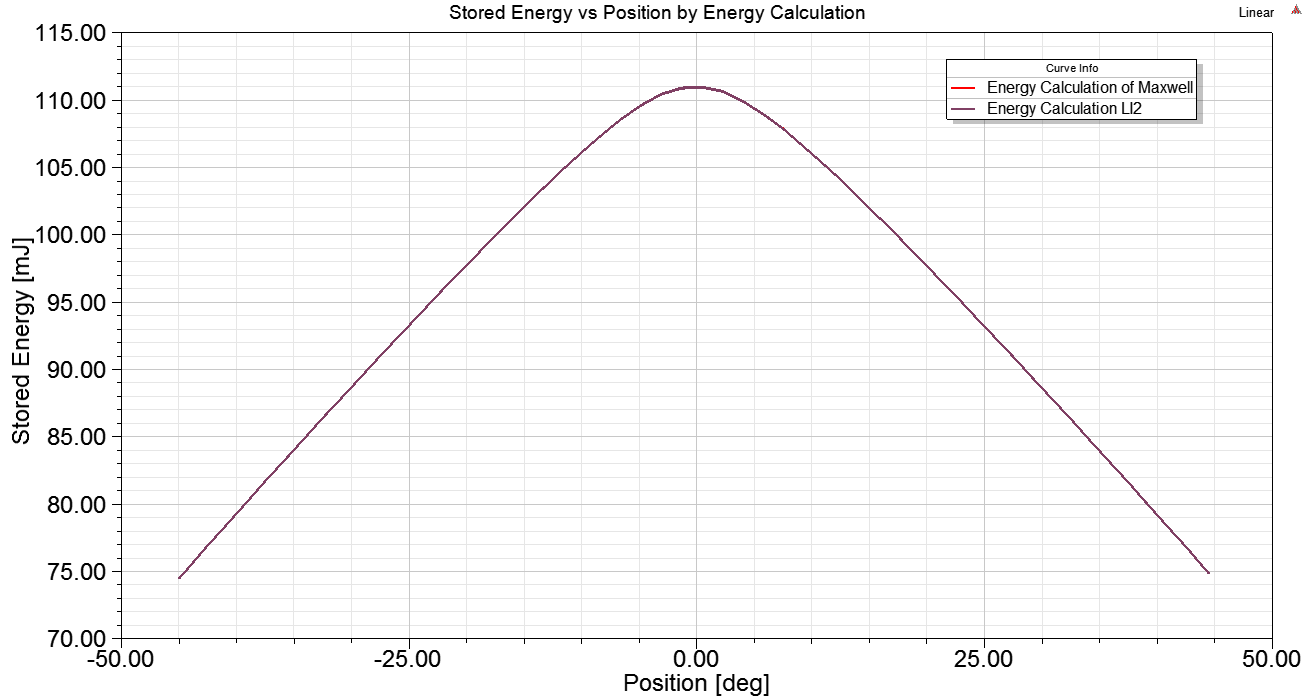


Figure 5: Stored energy for linear material

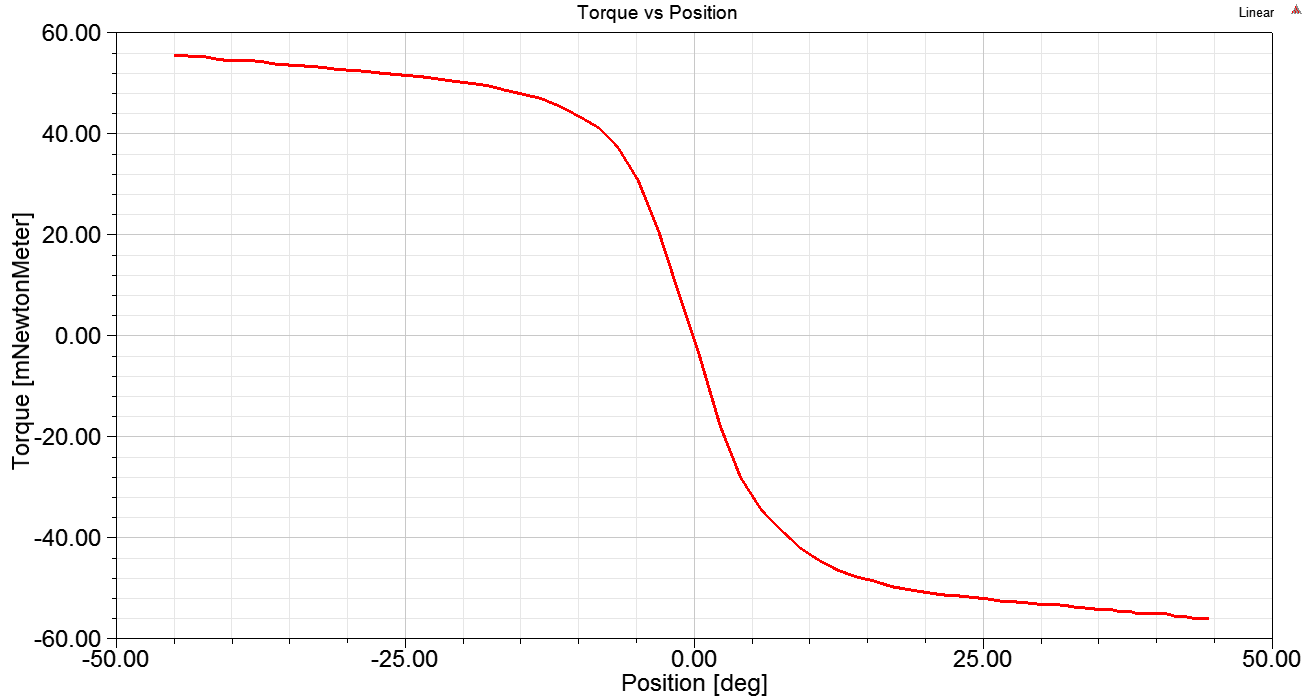


Figure 6: Torque for linear material

# Q3) FEA Modeling (2D – Nonlinear Materials)

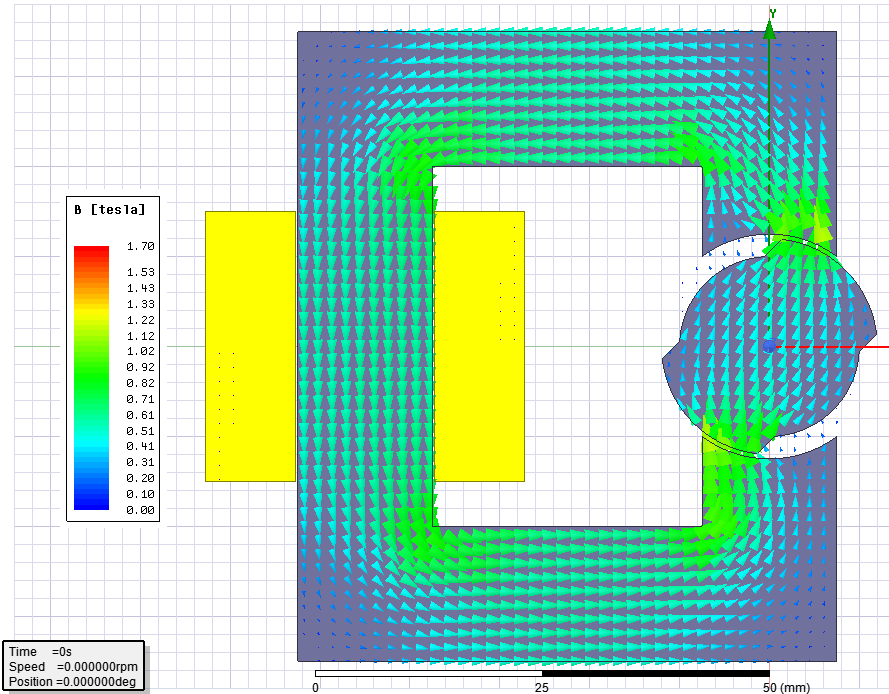


Figure 7:Flux density vector for non-linear material at -45 deg position

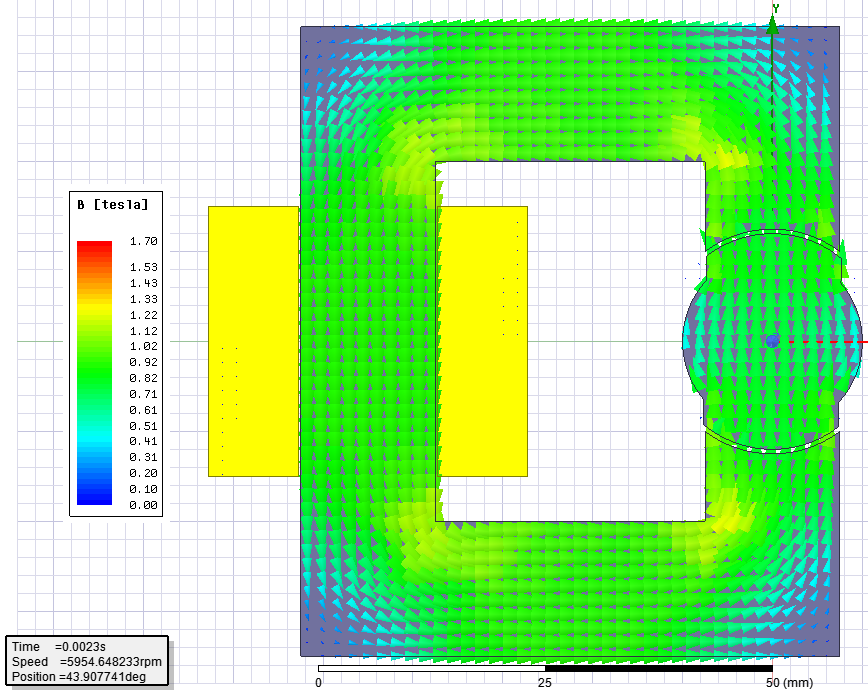


Figure 8:Flux density vector for non-linear material at 0 deg position

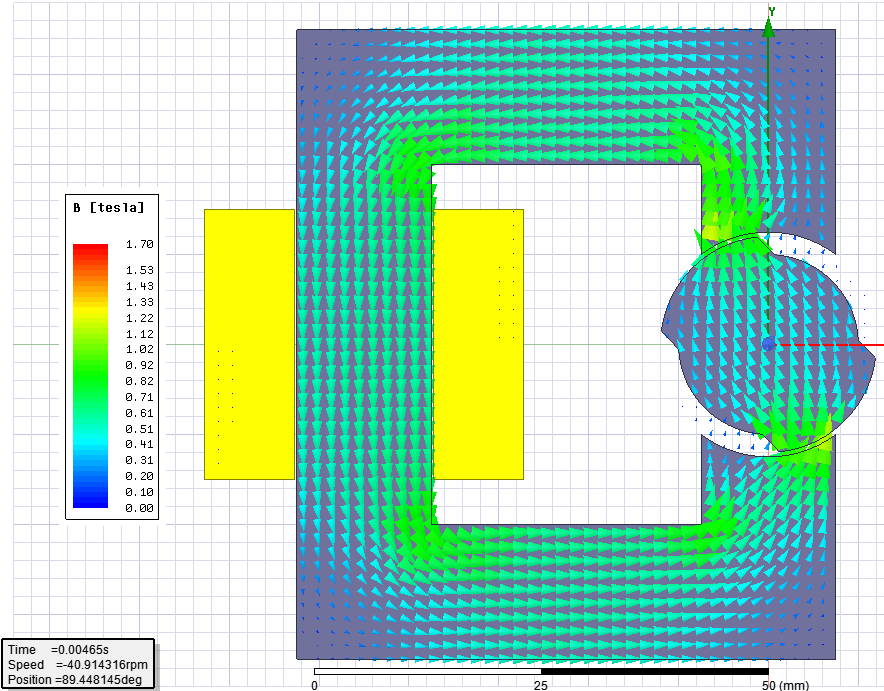


Figure 9:Flux density vector for non-linear material at 45 deg position

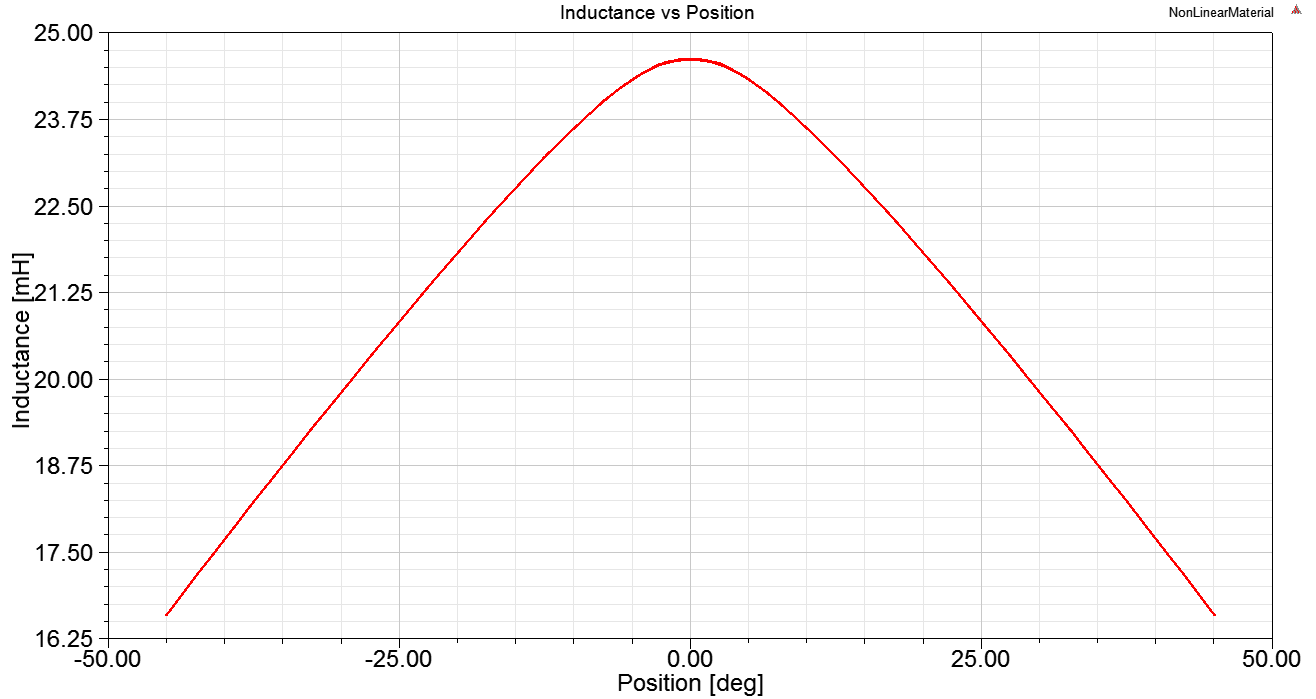


Figure 10: Inductance vs position for non-linear material

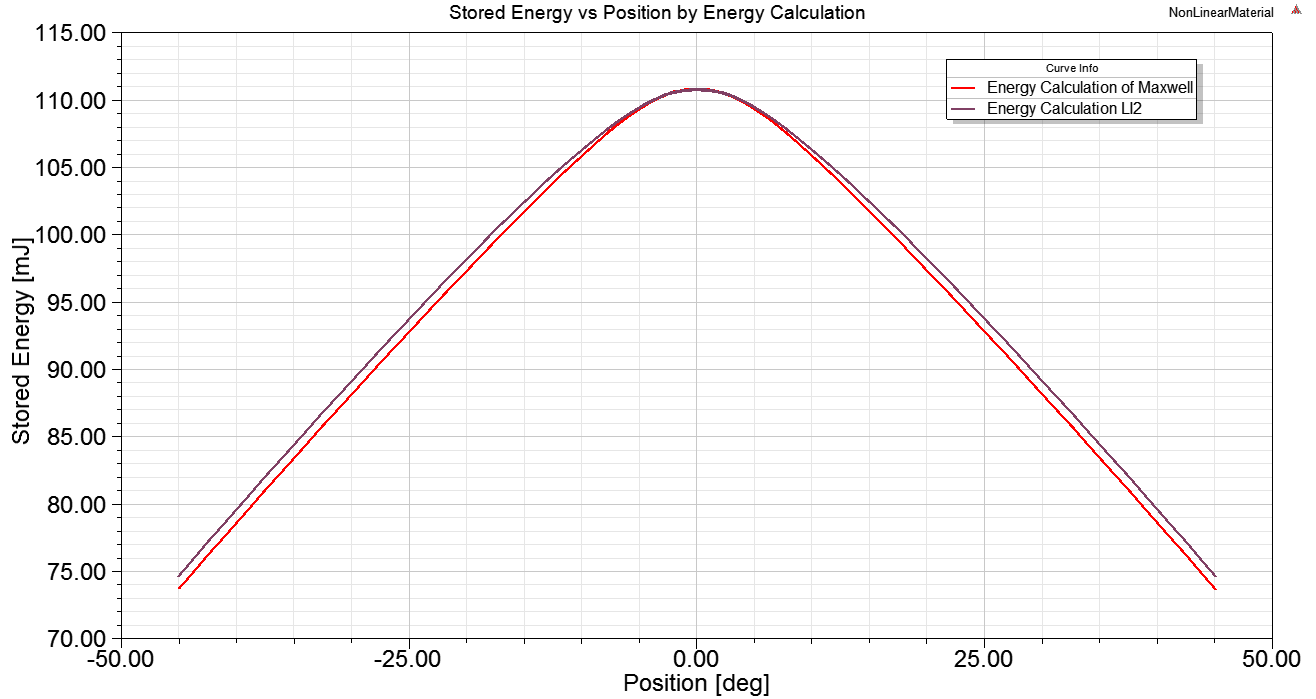


Figure 11: Stored energy for non-linear material

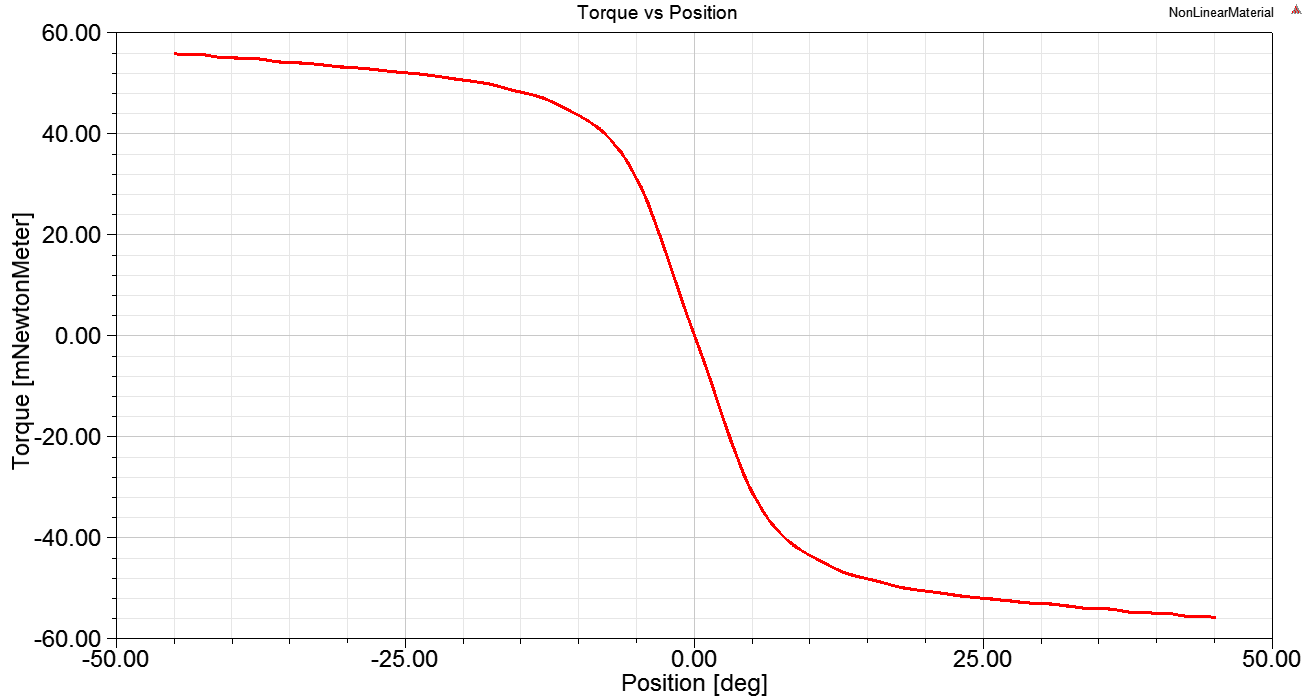


Figure 12: Torque for non-linear material

# Q4) Control Method

# Q5-6) Bonuses

All bonuses are uploaded to the project repository.