

# Electrodeposited Biaxially Textured $\text{CeO}_2$ Buffer Layer for YBCO

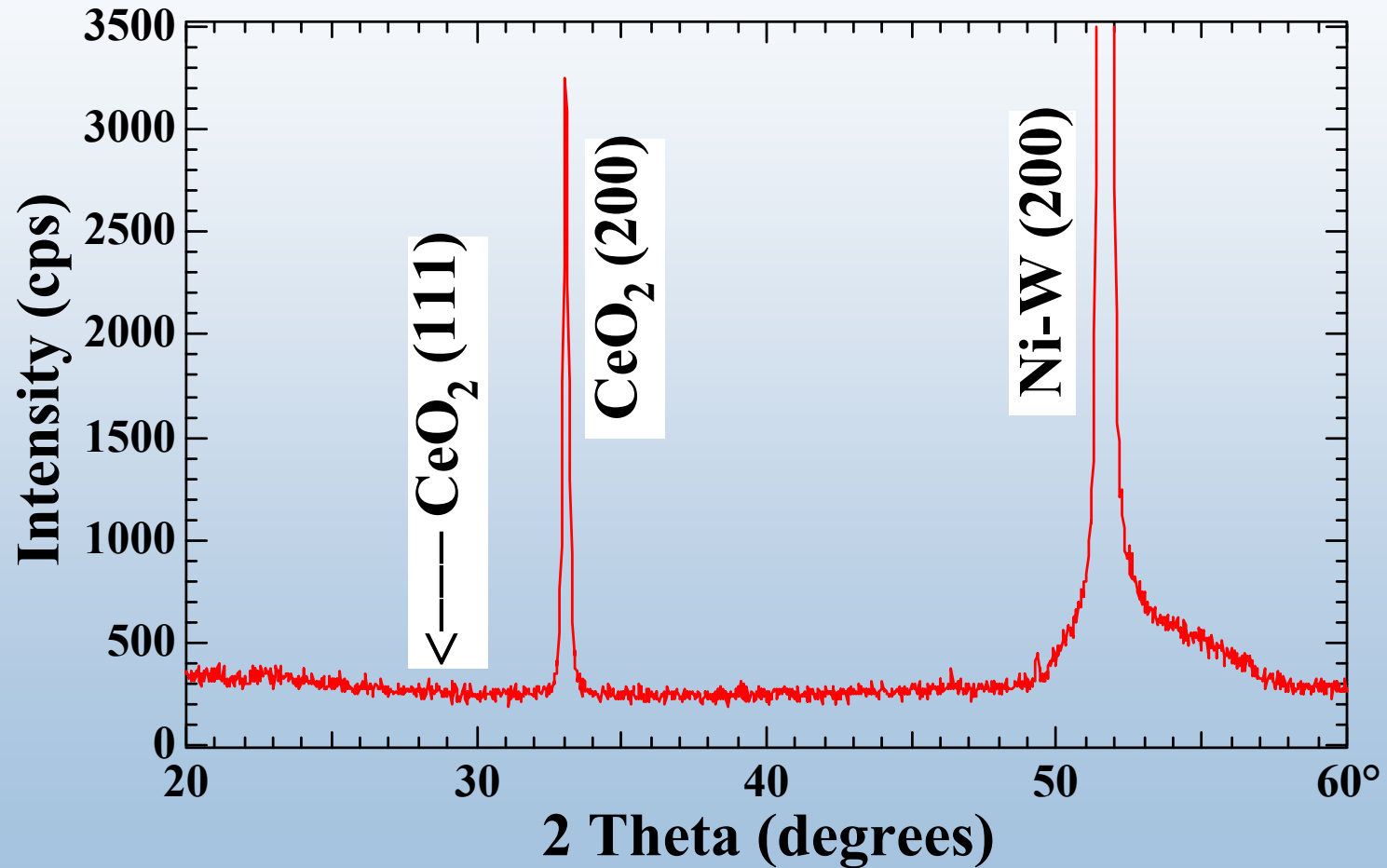
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M. Paranthaman D.F. Lee and Amit Goyal - ORNL  
Ken Marken - OST

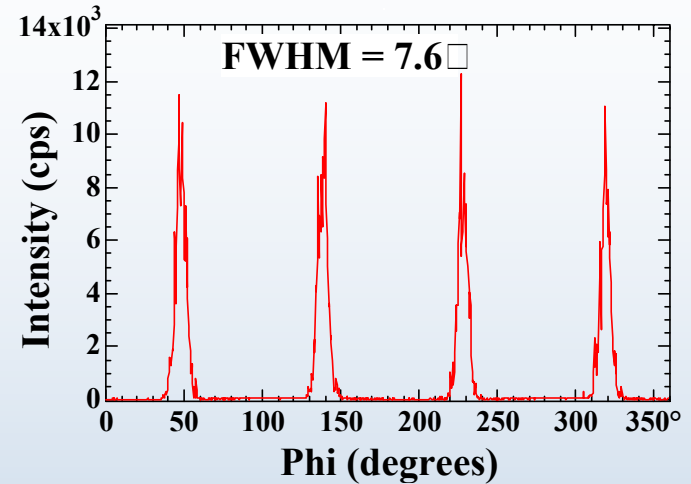
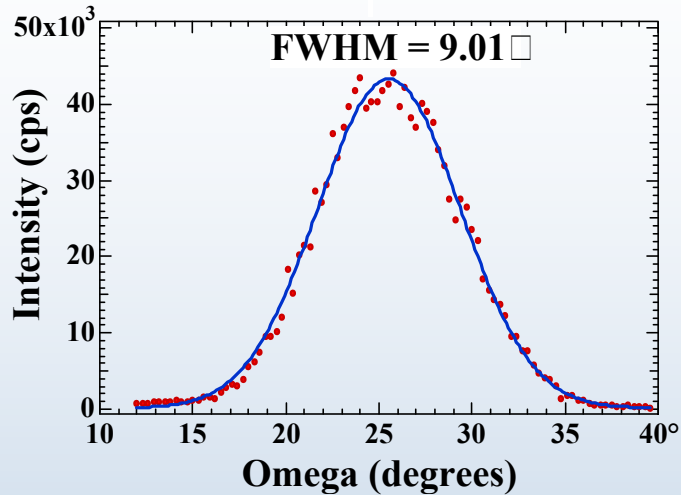
# Objectives

- **Prepare buffer layers by non-vacuum electrodeposition process.**
- **Simplify buffer layer architecture.**

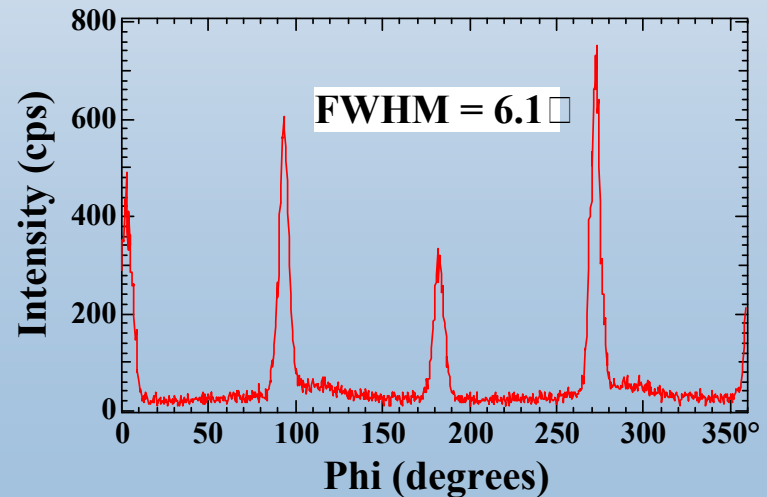
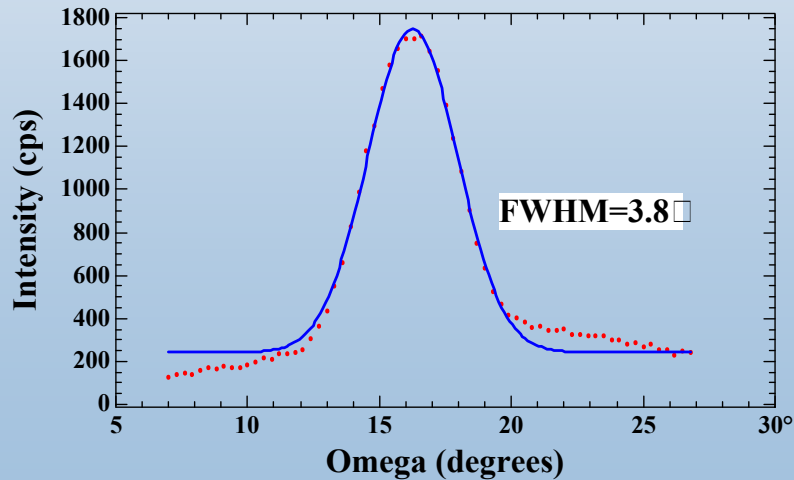
# XRD $\theta/2\theta$ of annealed electrodeposited film on Ni-W substrate



## Omega and Phi scan value of Ni-W substrate

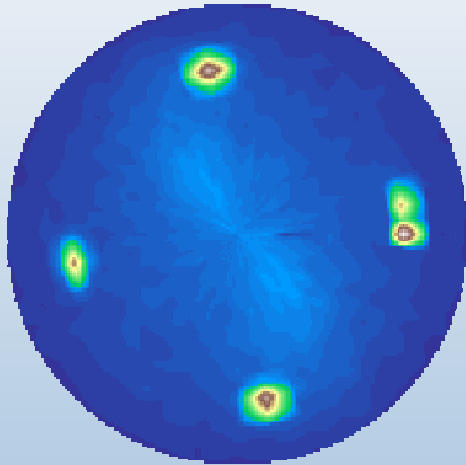


## Omega and Phi scan value of ED-CeO<sub>2</sub>/Ni-W

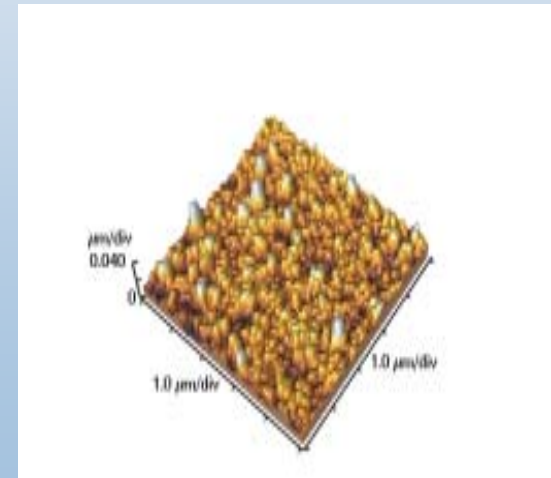
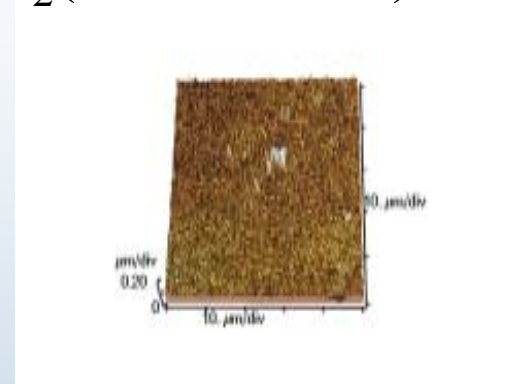
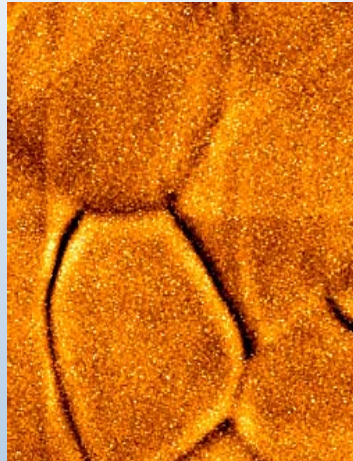


# Electrodeposited $\text{CeO}_2$ On Ni-W Substrate

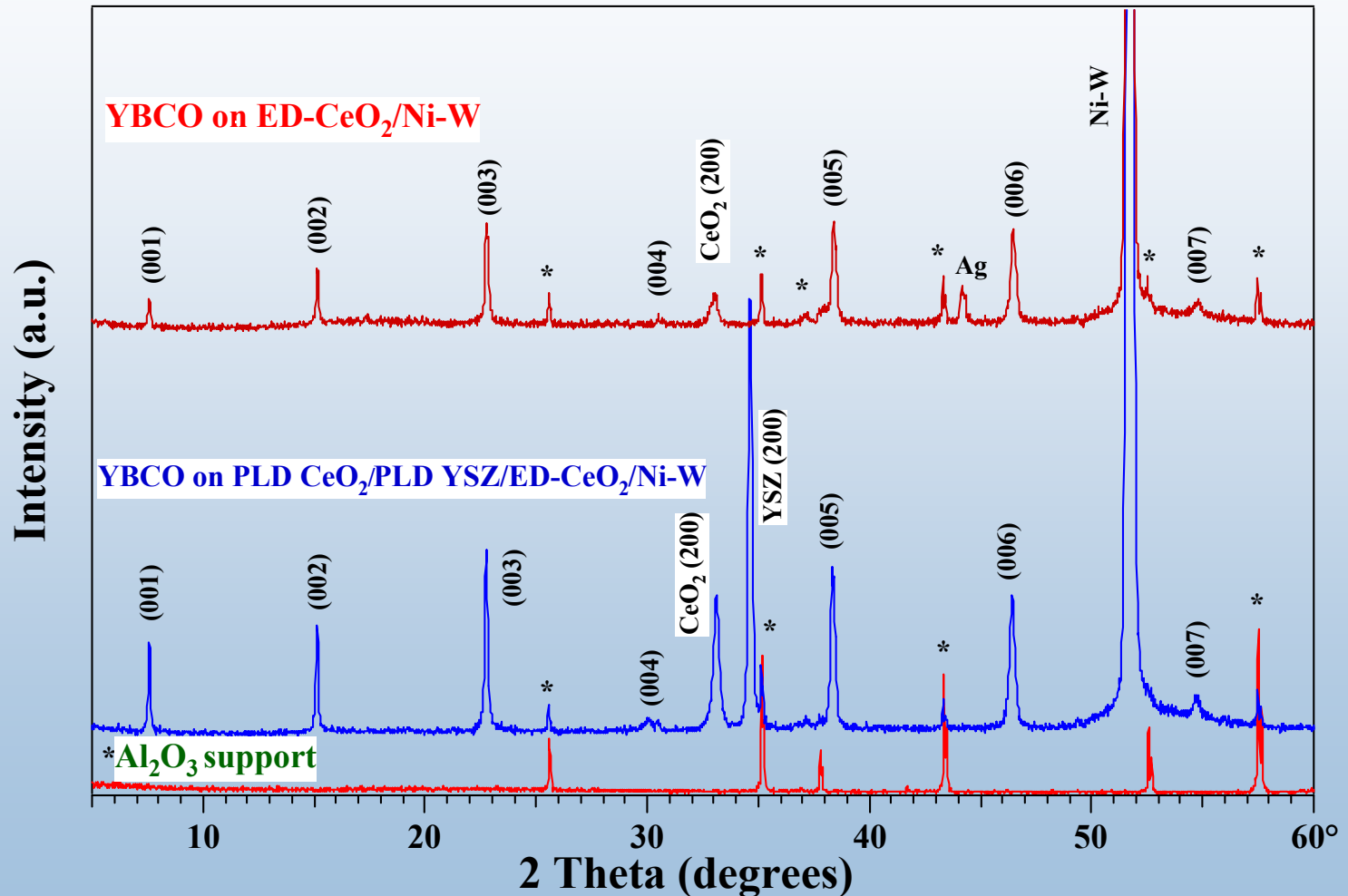
Biaxially Textured-Crack Free-ED  $\text{CeO}_2$ (RMS = 8nm)



$\text{CeO}_2$  (111) reflection



# YBCO with $J_c \sim 0.5 \text{ MA/cm}^2$ Prepared on ED-CeO<sub>2</sub>/Ni-W and ED-CeO<sub>2</sub>/Ni



# Conclusion

- **Good-quality biaxially textured YBCO has been prepared directly on electrodeposited CeO<sub>2</sub>/Ni-W and Ni.**
- **Electrodeposition is a potentially low-cost, non-vacuum technique.**