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Motivation

- Expand wireless communications to the 20 GHz (5G) C-band
- CMOS-based voltage-controlled oscillators (VCOs) not suitable for high frequency application
- Alternative based on ferromagnetic resonance/oscillator
- Current synthesis techniques based on vacuum deposition non-economical

Cheaper fabrication process to yield similar quality factor.

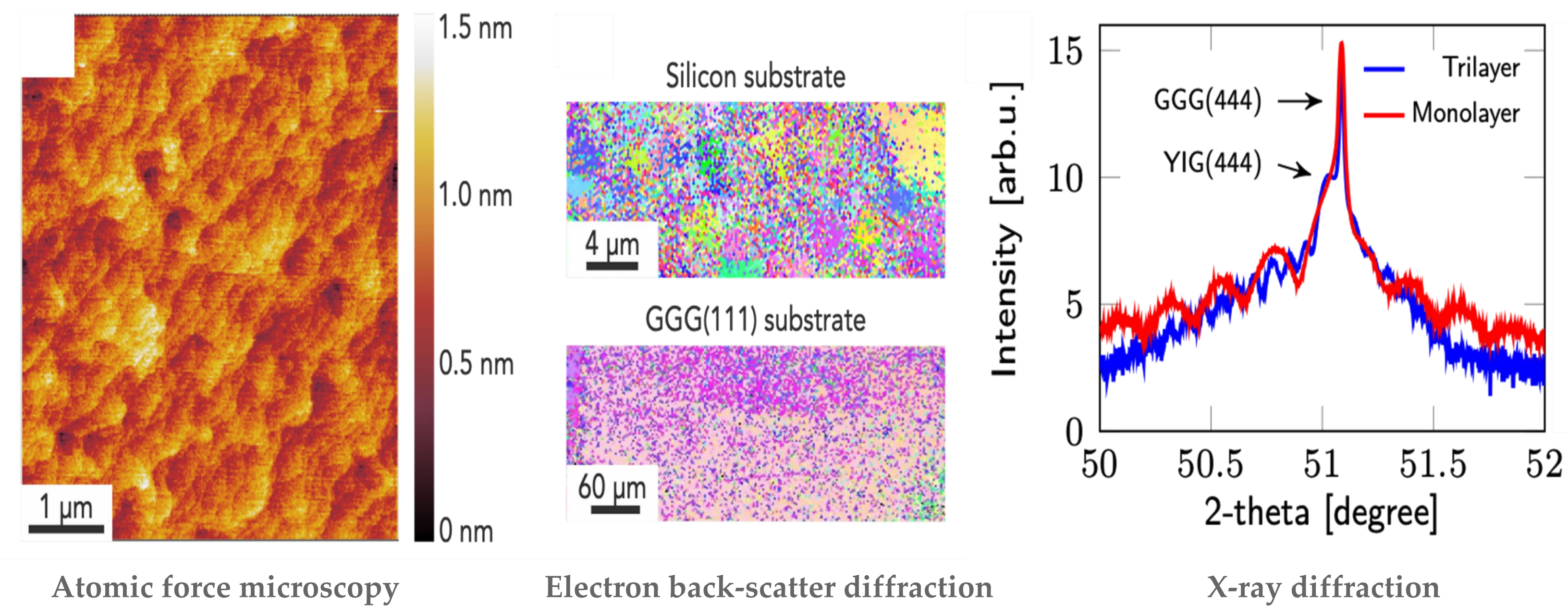
- Metal-organic decomposition epitaxy developed and patented by Vida Products
- Confirm structure and magnetic properties
- Leads to reliable application for commercial use

S.-F Wang, K. Chorazewicz, S. Lamichhane, R. Parrott, S. Cabrini, P. Fischer, N. Kent, J. Turner, T. Ishibashi, Z. P. Frohock, J. J. Wisser, P. Li, R. Zielinski, B. Herrington, Y. Suzuki, M. Wu, K. Munechika, C. Pina-Hernandez, R. Streubel, A. A. Sweet, Appl. Phys. Lett. 119, 172405 (2021)

Structural Characterization

Confirmation of film quality and homoepitaxial growth

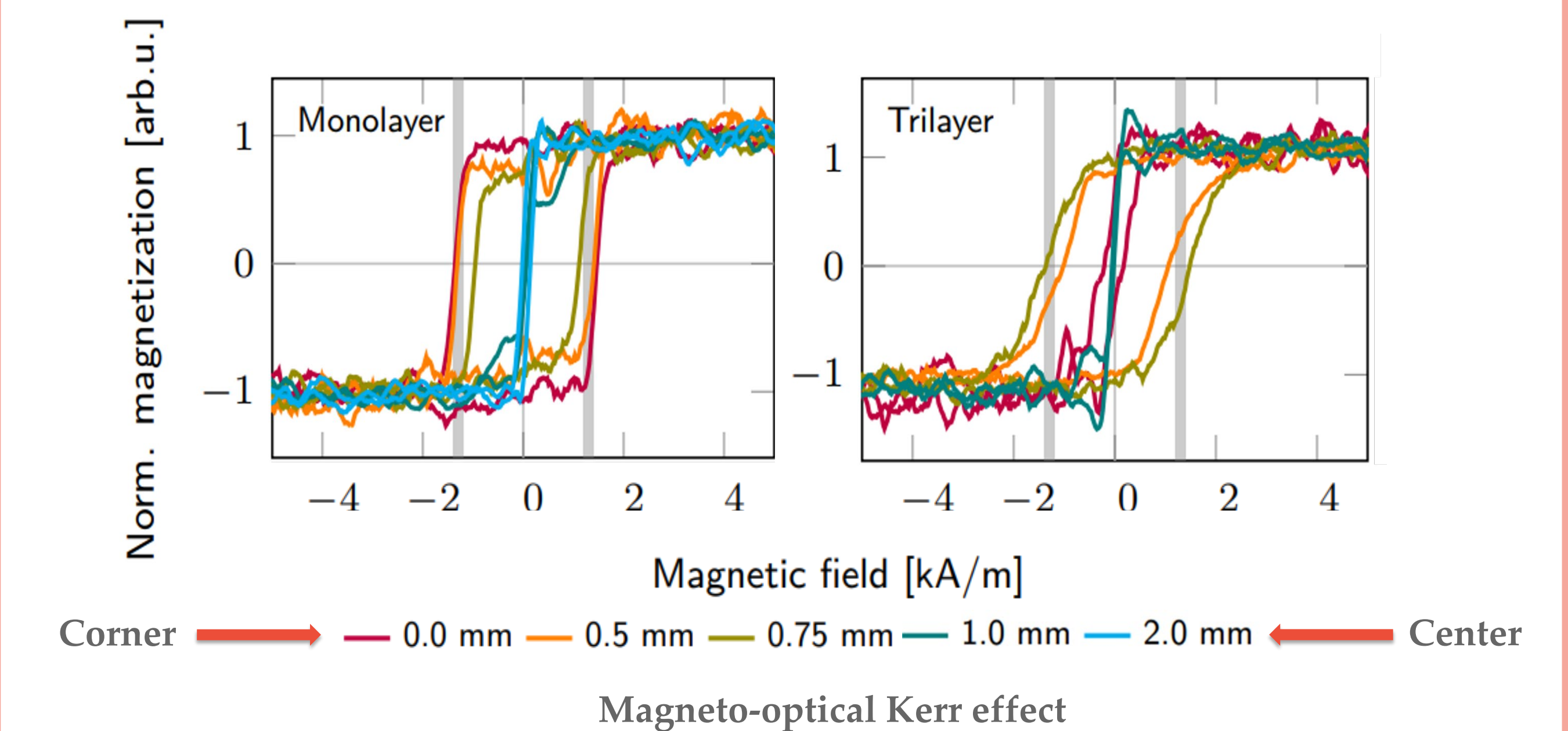
- Atomically flat terraces (roughness less than 2 nm)
- Poly-crystalline on silicon and single-crystalline on GGG (Check) garnet
- Monolayer and trilayer film 57 nm and 130 nm thick, respectively
- Structural properties resembled YIG film prepared by vacuum fabrication technique



Location Dependence of Magnetic Properties

Uniformity of magnetic properties near the center of samples

- Center region has same quality as films prepared by vacuum deposition
- Small coercive fields maintained for thicker films (trilayer)
- Inconsistency of properties near corners



Ferromagnetic Resonance

