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M4Or1A-02: [Invited] REBCO Magnets for Fusion Propulsion

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REBCO (Rare Earth Barium Copper Oxide) high-temperature superconducting (HTS) magnets are redefining fusion-based propulsion systems by enabling compact, high-field solutions critical for plasma confinement and acceleration. Operating at higher temperatures (20–77 K), REBCO magnets reduce cryogenic complexity and weight while achieving magnetic fields exceeding 2 Tesla, offering unmatched efficiency and scalability for deep-space missions.

This paper presents recent advancements in REBCO magnet development, emphasizing their application in fusion propulsion systems like magnetic shielding and high-field thrusters. Results demonstrate improved thermal stability, efficiency, and compactness, addressing key challenges in plasma confinement and thrust generation. These innovations accelerate progress toward interplanetary exploration.

Canyon Magnet Energy specializes in HTS technology, providing cutting-edge REBCO magnet systems for energy, healthcare, and space. The company is committed to delivering transformative solutions for sustainable energy and advanced propulsion.

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