Novel Superconducting Technologies for Conductors Exploratory Topic

PROJECT DESCRIPTIONS

UNIVERSITY OF HOUSTON – Houston, TX

Low-Cost, High-Rate Fabrication of High-Performance, Uniform, Long REBCO Conductors - $2,000,000

The University of Houston will scale up manufacturing of low-cost rare earth barium copper oxide conductors for high- temperature superconducting (HTS) tape to overcome barriers of implementing HTS in clean energy applications, including low-loss transmission cables, compact nuclear fusion reactors, high-power wind turbine generators, and highly efficient motors and generators. The proposed project will advance the metal organic chemical vapor deposition process to produce tapes with more than three times the critical current per unit width of today's industry tapes at a higher annual production rate than current industry capability.

HIGH TEMPERATURE SUPERCONDUCTORS, INC. – Santa Barbara, CA

High Throughput and High Quality, Lower Cost Coated Conductors - $5,000,000

High Temperature Superconductors will increase the production speed and reduce the cost of high-temperature superconducting coated conductor tapes by using a pulsed laser deposition process to support the development of transformational energy technologies including nuclear fusion reactors. By developing tools to expand the area on which the superconducting layers are deposited, the team at High Temperature Superconductors will raise production speeds by five to ten times compared to that of present-day levels while improving the quality and consistency of the materials.

METOX TECHNOLOGIES – Houston, TX

MetOx Low Cost MOCVD - $3,000,000

MetOx Technologies is developing faster manufacturing of low-cost high-temperature superconducting tapes to enable the energy transition, such as supporting more powerful electric grid cables and more powerful magnets to unlock fusion power generation. MetOx will transform its manufacturing process in several areas including improving equipment throughput, material efficiency, and tape performance. The proposed changes would increase the film deposition rates by five times and the current carrying capacity of the tapes by three times while providing significantly greater manufacturing yield.