PIEZOELECTRIC COMPOSITE FOR MORE EFFICIENT ROTODYNAMICS IN PETROCHEMICAL AND MINERAL PROCESSING

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The innovation is a defect-engineered piezoelectric polymer-ceramic composite that preserves electromechanical coupling at cryogenic temperatures and converts electrically induced strain into mechanical strain at a coupled metallic interface. This mechanism enables passive stiffness modulation in turbomachinery shafts operating at very low temperatures, where conventional piezoelectric materials depolarize or become brittle. In a turbo-expander shaft, mechanical strain increases as the operating speed approaches a critical speed, generating a piezoelectric voltage in the defect-engineered PVDF-ceramic composite.

This will be initially configured for mining and petroleum companies (petrochemical and mineral processing).

Example of a shaft within which the composite tech will be fabricated:

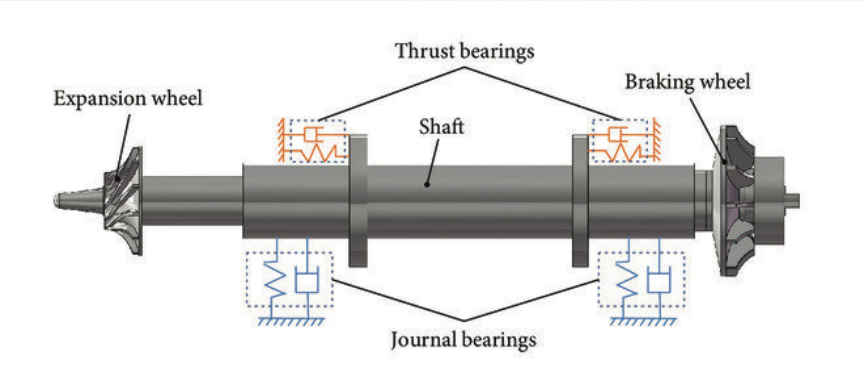

Fig available at https://www.researchgate.net/figure/Rotor-bearing-system-of-the-turboexpander_fig2_322164263