MUREP Small Business Technology Transfer (M-STTR) Planning Grants

Title: Developing a cylindrical-type wireless high temperature pressure sensor for rocket propulsion system test
Institution: University of North Texas
City/State: Denton, TX
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SUMMARY: NASA Rockets are exposed to very high stresses, especially during launch. To prevent malfunctioning during operation, rocket components, and especially rocket engines must undergo extensive ground testing and inspection. Among many engine performance metrics required, the pressure and temperature measurements are especially critical to ensure the engine is operating at normal condition. However, the high temperature, high pressure and strong vibrations during the test have prevented many existing pressure sensors from operating normally and reliably. In this proposal, University of North Texas (UNT) and X-wave Technologies Inc are collaborating to develop an innovative LGS cylindrical-type high temperature pressure sensor that will bridge the gap between the urgent needs from NASA and the state-of-the-art sensing techniques. The proposed pressure sensor can operate in a harsh environment up to 1000°C and provide accurate pressure measurement up to 20000 psi, it can also measure the temperature simultaneously. The cylinder-type sensor is also capable of minimizing the unbalance loading due to the fixture of housing and packaging. Successful development of this novel sensor will be the first-type in the pressure sensor industry and will provide an accurate measurement which will enable optimal design and control of the engine as well as significant cost savings.