Ultrasonic Drilling and Coring

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FLEXIBLE GUIDEWIRE ULTRASONIC DRILLING

- Ultrasonic device demonstrated to drill rocks.

- Tungsten carbide flexible wire is guided in arteries to destroy blockages.

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Ultrasonic Driller
Ultrasonic Corer

General view of the corer actuator and end effector
FEM of Ultrasonic Driller/Corer
Commercialization potential

- Medical application to orthopedic operations and others
- Construction tools
- Robotic drilling and hammering
- Potential consumer product (e.g., concrete drilling tool at Homedepot).
- Effective grinder and marker, ceramic machining, etc.
Summary

• A novel drilling and coring device, driven by a combination of sonic and ultrasonic vibration, was developed.

• The device is applicable to soft and hard objects using low axial load and potentially operational under extreme conditions.

• The device has numerous potential planetary applications.

• Significant potential for commercialization in construction, demining, drilling and medical technologies.