

Wireless Communication via Drill Strings in Oil Wells

To extract oil from underground reservoirs, a well needs to be drilled. During the drilling process, real-time transmission of important data such as temperature, pressure, torque, drilling direction, etc., from downhole to the surface is of high importance. Such data allows the driller to closely monitor the process, change the drilling direction, adjust the penetration rate, etc., to minimize the failure chance of the costly operation and machines.

Since boreholes are typically very deep, several thousand feet or more, wired communication is very expensive and prone to failure. One feasible way is wireless communication using sound waves in drill strings. This research of the aCASP Lab is focused on utilizing the physics of sound propagation in steel pipes, to achieve high transmission rates.