SYSTEM TO MEASURE VIBRATIONS USING FIBER OPTIC SENSORS

ABSTRACT

[0032] A vibration monitoring system for an electrical submersible pump (ESP) that includes a fiber optic cable coupled with the ESP and an optical sensor coupled with the fiber optic cable. The optical sensor emits electromagnetic radiation into the fiber optic cable, some of which reflects back from optical discontinuities provided in the fiber optic cable. By receiving the reflected electromagnetic radiation, the optical sensor estimates the location of the optical discontinuities. Displacement and rate of displacement of the optical discontinuities can be estimated when the reflections are received over a period of time. Because the fiber optic cable, and the optical discontinuities, move with the ESP, displacement measurements of the optical discontinuities correlate to ESP movement, including ESP vibration

Figure 1