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ABSTRACT

The present invention discloses a hydraulic structure seepage property distributed optical fiber sensing integrated system and a method. The system comprises a special optical fiber for seepage measurement, an optical fiber calibration device, an optical fiber laying device, and a seepage property identification device. After the optical fiber calibration device calibrates the special optical fiber for seepage measurement on site, the special optical fiber for seepage measurement is laid and tested with the aid of the optical fiber laying device, and is connected to the seepage property identification device for information collection, processing and analysis after the test is successful. By adopting the system and the method, a long optical fiber can be calibrated efficiently, and the bending curvature of the long optical fiber can be controlled and measured reliably. By combining the special optical fiber for seepage measurement with a special optical fiber for seepage measurement having an automatic control heat source and a seepage property identification technology based on femtosecond pulse, the seepage property of the hydraulic structure can be remotely sensed with high precision and high spatial resolution at a high sensing speed.

Fig. 1