

Interactive comment on “Research and Application of an Inner Thrust Measurement System for Rock and Soil Masses based On OFDR” by Yimin Liu et al.

Yimin Liu et al.

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Dear reviewer 1#iijZ

We are very grateful to this referee comments, and we have carefully read and considered the referee's comments, and these comments are important for improving the quality of this manuscript. Based on these comments, we have made carefully modification of language and technical issues in the original manuscript, the detail modifications are shown in next chapter.

Thank you very much for your suggestion and consideration, and we look forward to

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hearing from you. Best regards,

Yimin Liu and Chenghu Wang.

Detailed revision:

(1) Line 24: "prospects" is wrong.

Modification: In the previous manuscript, "has good engineering application prospects in the safety monitoring field", it is not so accurate and clear. We revise it as "has a good application prospect in the safety monitoring field".

(2) Line 28: "domestically and abroad" is wrong.

Modification: We revise it as "at home and abroad".

(3) Line 35: "the disaster body movement " is wrong.

Modification: We revise it as "early warning and prediction of the geological disaster cannot be accurately achieved".

(4) Line 45: "Dehua Liu et al." is wrong format of citation.

Modification: We revise it as "Liu et al.".

(5) Line 58: "Bin Shi et al." is wrong format of citation.

Modification: We revise it as "Shi et al.".

(6) Line 67: Should "demodulator" be interrogator?

Explanation: The fiber demodulator is the device that converts optical signals into electrical signals, so this place should be "demodulator".

(7) Line 226: "Mpa" should be "MPa".

Modification: We are sorry for this error, and correct them.

(8) Figure 14 is very confusing. A 3D cartoon is required.

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Modification: We have redraw a 3D figure for the OFDR sensors installation.

(9) How does the temperature affect the measurement?

Explanation: Different from fiber Bragg grating, the polarization-preserving single-mode fiber used in this OFDR sensing component is not affected by temperature. Moreover, the sensor assembly is installed in the deep rock mass, and generally does not consider the error caused by temperature change.

(10) For monitoring purpose, time history of the pressure is desirable.

Modification and explanation: Tables 3 and 4 show positioning accuracy of the OFDR sensing component and the pressure value in the first measurement. And your suggestion is reasonable and necessary, we have selected the pressure monitoring data of TK-01 monitoring site from February 2017 to December 2019, and the data table and pressure-time curve are shown in table 1 and figure 2. These data and the curves show that, this OFDR thrust measurement system operates normally for a long time, and the measured data of OFDR sensor component are relatively stable, which means the landslide is in a creep state. And we have added this content from line 306 to 315.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss.,
<https://doi.org/10.5194/gi-2020-6>, 2020.

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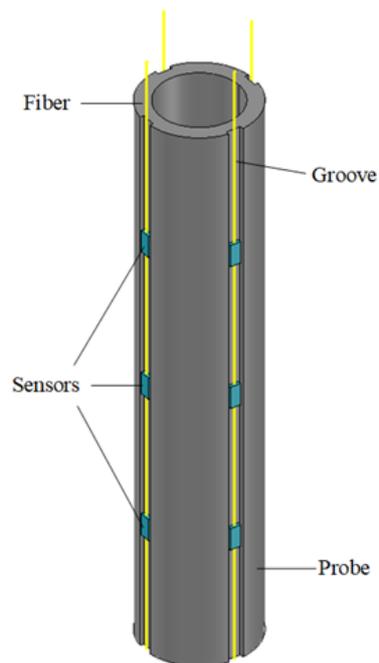


Figure 1: OFDR sensors installation method

Fig. 1.

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Table 1. The pressure data table of TK-01

Measurement Time	1# Sensor	2# Sensor	3# Sensor	4# Sensor	5# Sensor	6# Sensor
2017/2/1	0.0403	0.0563	0.0589	0.0422	0.0907	0.0854
2017/5/5	0.0453	0.0653	0.0609	0.0405	0.0885	0.0863
2017/8/15	0.0545	0.0764	0.0779	0.0400	0.1154	0.0854
2017/9/14	0.0519	0.0763	0.0754	0.0325	0.1134	0.0868
2017/11/15	0.0462	0.0662	0.0765	0.0399	0.1200	0.0862
2018/2/13	0.0457	0.0668	0.0741	0.0302	0.1053	0.0854
2018/5/14	0.0562	0.0685	0.0699	0.0266	0.1193	0.0863
2018/7/10	0.0554	0.0713	0.0706	0.0321	0.1193	0.0860
2018/8/17	0.0662	0.0746	0.0724	0.0303	0.1104	0.0862
2018/9/11	0.0625	0.0710	0.0703	0.0265	0.1255	0.0855
2018/12/19	0.0557	0.0700	0.0685	0.0325	0.1188	0.0867
2019/2/16	0.0512	0.0751	0.0710	0.0299	0.1104	0.0888
2019/5/15	0.0572	0.0891	0.0700	0.0365	0.1223	0.0862
2019/7/17	0.0592	0.0769	0.0751	0.0333	0.1224	0.0867
2019/8/16	0.0685	0.0899	0.0891	0.0370	0.1235	0.0867
2019/12/24	0.0652	0.0799	0.0875	0.0370	0.1158	0.0863

Fig. 2.

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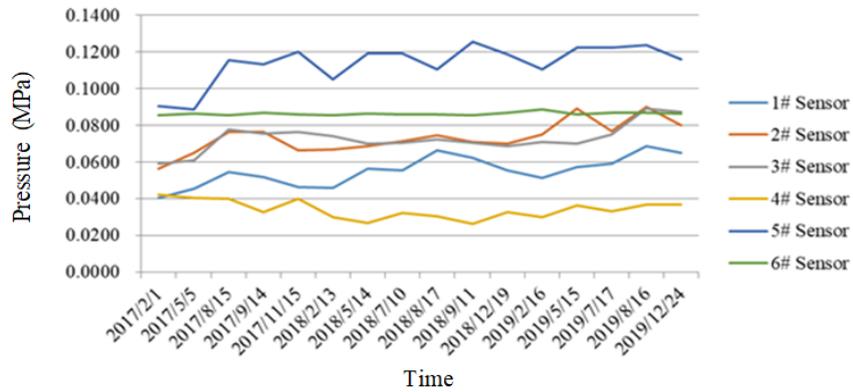


Figure 2: Monitoring data curves of multiple sensors

Fig. 3.

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