Answer to the comments of Andrea Billi

Dear Andrea Billi,

Thank you very much for your kind review of our manuscript and the helpful comments. In the following we answer to each issue individually:

1. *One problem I have had is that I was unable to access the data repository to check the supplemental material.*

→ We agree with the reviewer that access to the supplementary material is not perfectly solved. This is mostly due to the large amount of video files. However we finally found a way to publish the videos as one dataset with one DOI using Pangea Data Publisher for Earth & environmental Science. We added the following sentence to the text and updated further references:
"Movies produced from image series of all experiments and the respective PIV images are freely accessible at https://issues.pangaea.de/browse/PDI-11894"

The data publishing is however still in progress. Until the videos are finally published with open access with an assigned DOI (which will be the case for the final version of the manuscript) the videos can be found here:
https://rwth-aachen.sciebo.de/index.php/s/adccOLuVPT2dk63

2. *I see that the core/synthesis of all the work done is in the diagram of Fig. 10, where a series of features/parameters such as joint connectivity, degree of fault segmentation, etc are graphed against the angle between pre-existing joints and the main (developing) normal fault. From the text (sections 3 and 4) and the figures (Figs 2-5) I cannot well understand how most of these parameters are measured (e.g. joint connectivity) and where the raw data are stored/shown.*

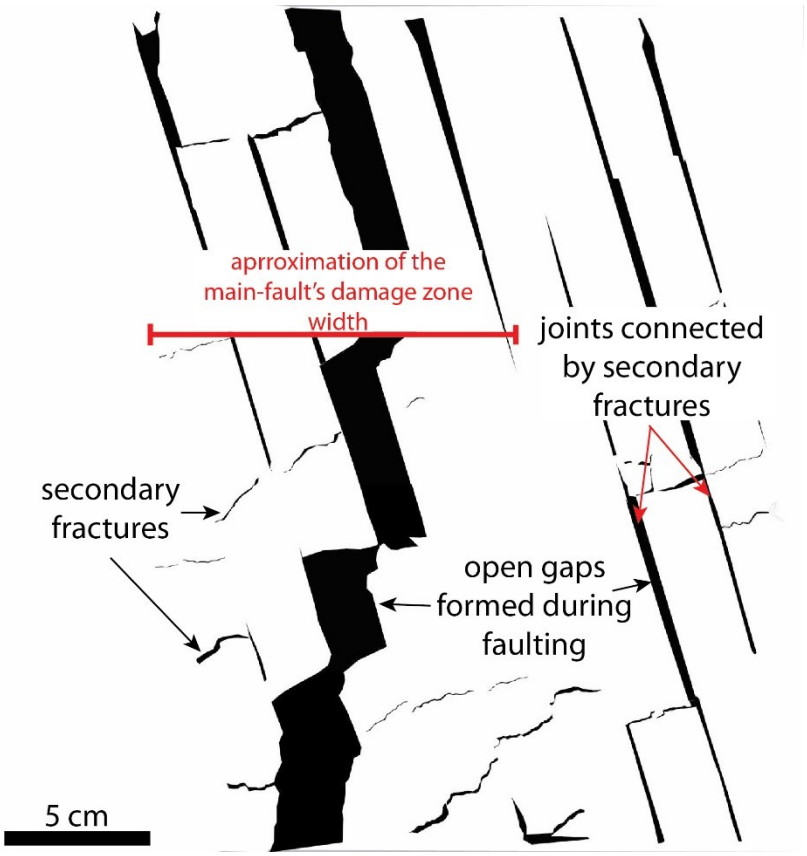
→ This is a valid comment. In the new version of the manuscript we include pictures and interpretation in the appendix. We added a sentence to the manuscript: "**Pictures of the experiments and their interpretation can be found in the appendix."**

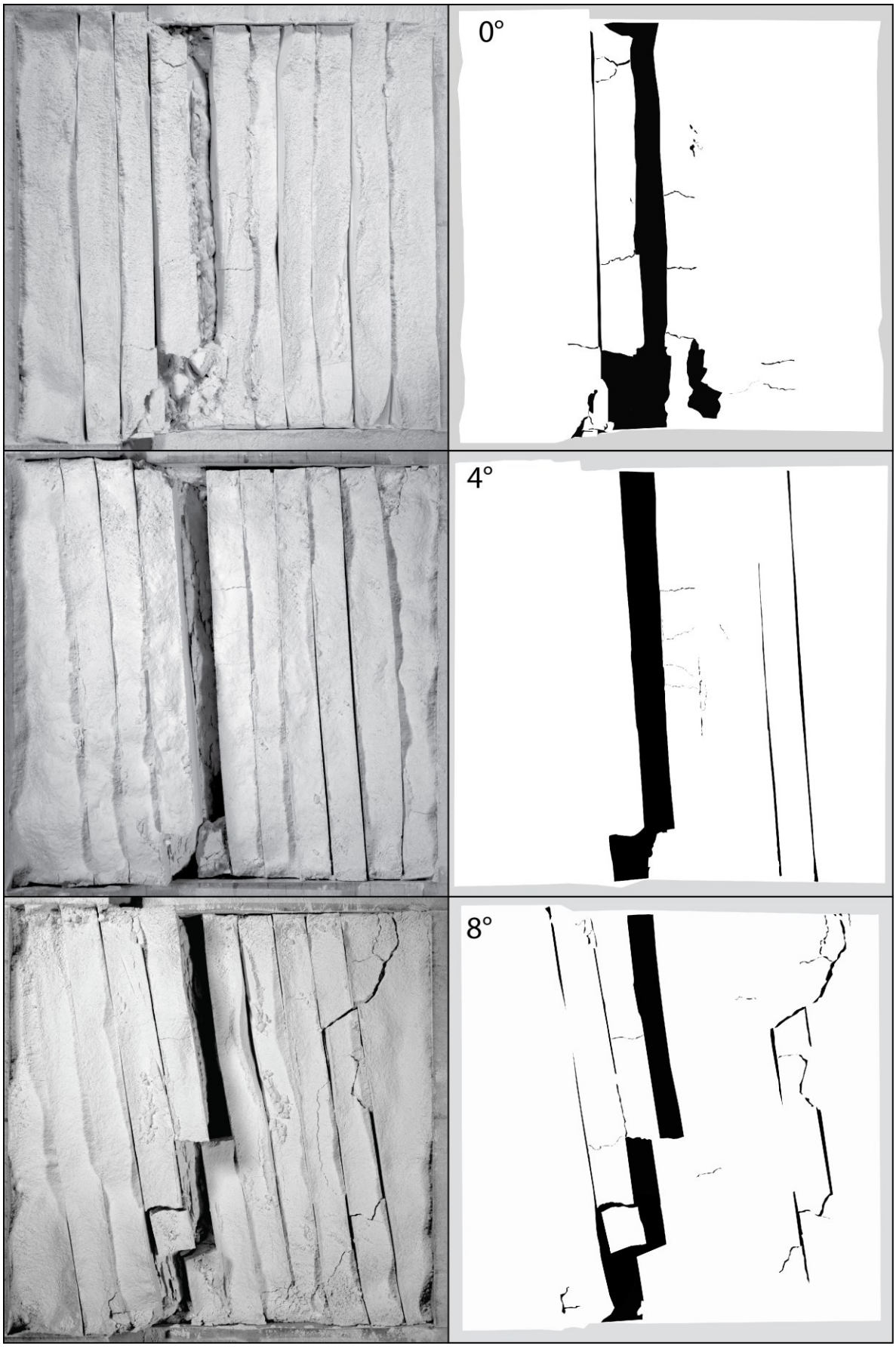
3. *Further information about measurements and data will be very important to complete this work, at least in my opinion. I refer to enhanced figures, a synoptic table of data, and more text to better explain data acquisition.*

→ In the new version of the manuscript we also add a table summarizing our data. For showing better data acquisition, we added to figure 9 how we performed interpretation following basic routines. Additionally we added some details on methods in the text ("Section "Quantitative analysis of the analogue models" to clarify the measurement workflow. It now reads:

"In order to quantify the effect of JF angle, we carried out analysis of the following measureable parameters using interpreted map view images (see Fig. 10 for interpreted map and illustration of measured parameters): Maximum damage zone width, area fraction of open gaps, degree of segmentation, number of secondary fractures and number of connected pre-existing joints within the damage zone. For quantifying damage zone width, we measure the maximum distance

between the un-fractured parts of the host rock around the master fault (see Fig. 10). In cases where damage by the main fault cannot be separated from damage by the antithetic fault, half the distance between both is assumed as damage zone boundary. To measure the area fraction of open gaps, we manually traced the open fracture networks and quantified their percentage of bulk area using the ImageJ software (Abràmoff et al., 2004). Degree of segmentation is the total number of pre-existing joints accommodating strain, which was determined using PIV analysis. Eventually, we measure the angles between pre-existing joints and secondary fractures using ArcMap software (ESRI - Environmental Systems Resource Institute, 2014). Top-view photographs of all experiments and their interpretation can be found in the appendix. Table 2 summarizes the measured data."

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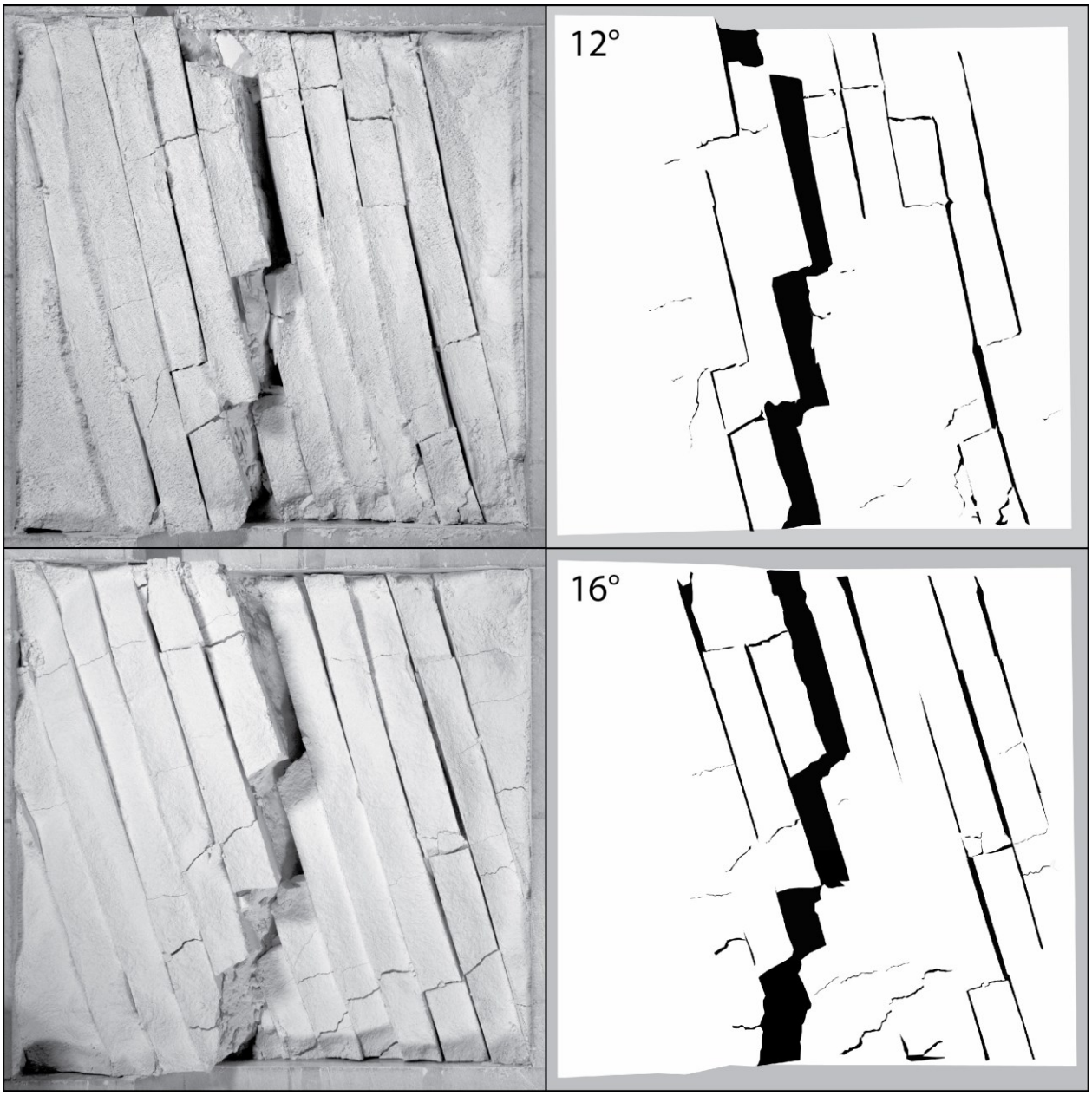
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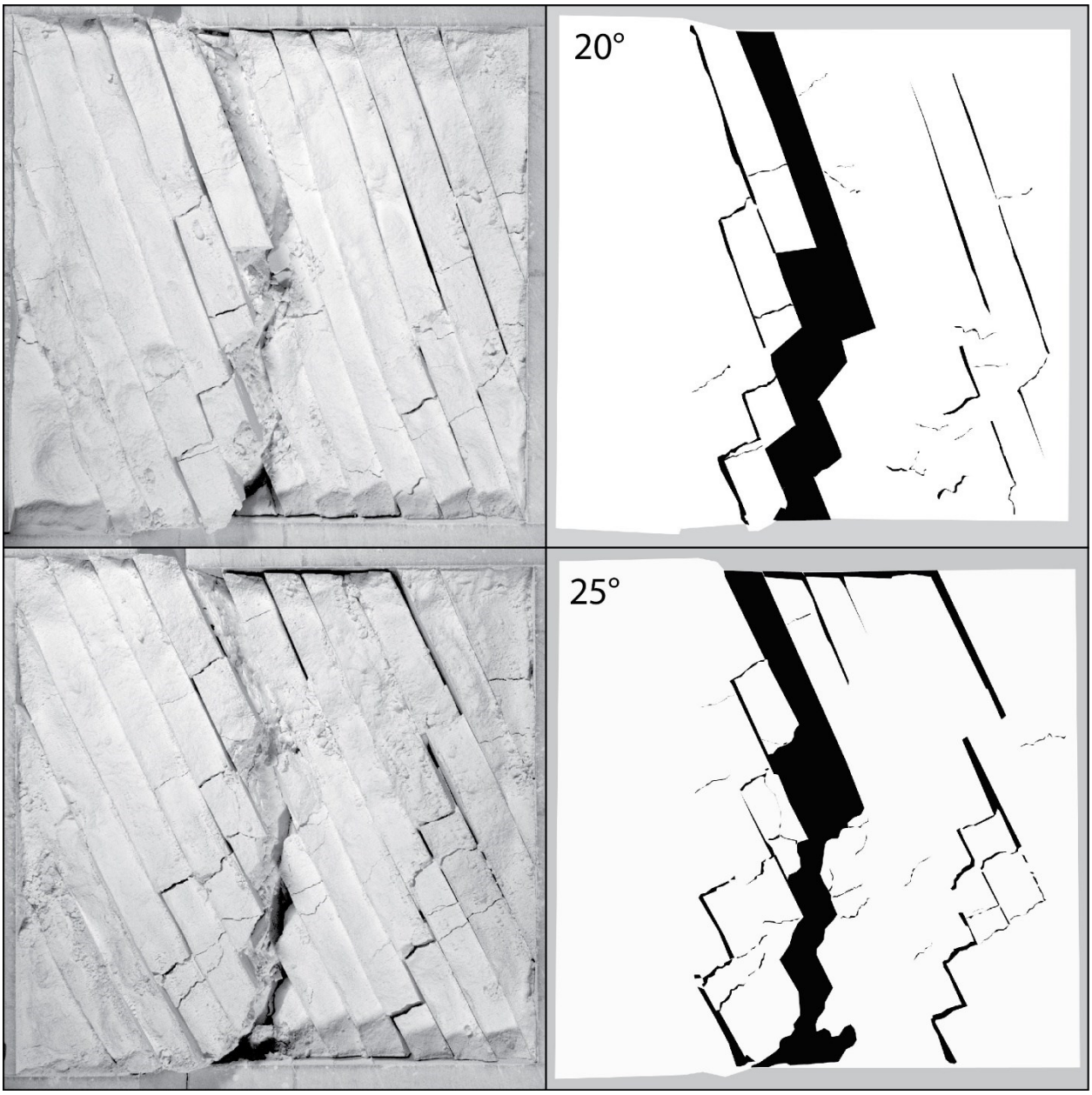
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