## APPENDIX 1

### Results of test measurements: T1 Andrarum, T2 Andrarum, T3 Degerhamn.

T1 Andrarum test indicates a mean error of ±3°, based on 30 measurements. In comparison to the assumed GC accuracy of ~2°, the reported error can be neglected. This shows, that summarized the input of potential reconstruction and reorientation errors for specific fracture plane measurement in DOM is almost irrelevant for structural measurements.

Test T2 Andrarum – Andrarum site is located in an abandoned Alum Shale quarry. The analysed wall has dimensions of 20 x 6 metres. Its major part is trending ca. 015°, while the rest about 70°. Two of the major joint sets, JS 1 (st = 017°) and JS 3 – (st = 351°), are well defined by the data collected in this place. In DOM measurements strike of JS 3 is slightly moved (~10°) clockwise. Also, analysing the auto DOM data, JS 1 is apparently moved near 10° clockwise. Simultaneously in both, JS 1 and JS 3, the variability of orientations exceeding 10° for single fractures is observed. Only JS 1 in GC and manual DOM data shows very clear maxima while the orientation of this set does not vary significantly. Joints of JS 4 (st = 087°) were detected with a GC and manual DOM data. Lack of this set, in auto DOM data is interpreted as related to wall exposure. Joints of this set are exposed mostly in form of a high, narrow (in relation to initial point sampling) surfaces on the N-S trending exposure wall. Such placement leads to an underestimation of joints belonging to this set. JS 2 (st = 307°) is visible, though to a small extent in GC and auto DOM data showing similar orientations. In the manual DOM data, there is no distinguishable cluster that can correspond to JS 2. The closest clusters are striking 275° and 335°, probably both of them gather part of joints belonging to this set. Also, JS 5 (st = 050°) was recognised in auto and manual DOM data as a clearly visible set. In auto DOM data, this set (st = 052°) is divided into two sub-clusters showing the multimodal distribution of joints with 040-080° strikes and 80-90° dips, which is probably due to the incorporation of JS 4. In GC data, JS 5 is also present, but the lack of clear maxima in a cluster suggests a high level of uncertainty for detected orientation. Generally, the T2 Andrarum test shows a consistent dominance of two joint sets trending NNW and NNE. Furthermore, the GC and manual DOM results indicate a subordinate E-W joint trend, which is difficult to separate from the auto DOM.

The T3 Degerhamn test was performed in the active quarry located in Öland Island. Measurements were taken on two inactive quarry walls. DOM data is based on a 015° trending wall measuring 50 x 3.5 m, where two main rock types appear, 2.2 m of Alum Shale in the lower part and 1.3 m of Tremadocian limestone in the upper part. GC measurements were taken one quarry level higher, in Ordovician limestone beds, on ~60 m long wall trending 340°. For trace analysis (TA), a well-exposed surface in size of 130 x 180 m located ~5 km south from the Degerhamn quarry was chosen. The flat-lying Ordovician limestone (the same strata as in the quarry) appearing there creates a surface with visible fracture traces, only locally covered by barren vegetation. In Degerhamn, major fracture pattern resembles these of the Andrarum site, with changes in the incidence of joints in individual JS and a slight change in the orientation of some JS depending on the method used. In GC data JS 1 (st = 016°) and JS 3 (st = 351°) are dominant, while TA shows JS 1 (st = 029°) and JS 4 (st = 071°) as the most frequent orientations. DOM delivered data, depending on the method subtype, is dominated first by JS 1 (st = 031°) and second by JS 2 (st = 299°) in a "manual DOM" subtype, while JS 1 (st = 029°) is most common orientation in "Auto DOM" subtype, definitely standing out from the rest joint sets. JS 1 (mean st 026°) is clearly traceable in all data. In both DOM and TA measurements it creates a clear maximum for the strikes of 030°. In GC data its strike is rotated ~15° counter-clockwise, whilst the maximum is less distinguishable. JS 3 (mean st 347°) does not show clear maxima in all data studied, however, multimodal behaviour is associated with strikes of 000-300° and dips of 80-90°. DOM data allow distinguishing two subsets in this range, first striking 335° and second striking 0°, which change their intensities between manual and auto DOM data. JS 4 (mean st = 073°) is best visible in TA and manual DOM data. In auto DOM it is clearly distinguishable despite its low density on the contour plot. In GC data JS 4 does not form a clear maximum. JS 2 (mean st = 297°) is constant in all data, showing no significant deviations. Similarly, as for JS 4, despite low density JS2 forms a clear maximum on contour plot and thus can be easily distinguished. JS 5 (mean st = 050°) is present only in manual DOM data where it is visible but does not create a clear maximum.

A comparison of the results from the Degerhamn quarry and the surrounding area indicates that there are four joint sets in the study area. However, the significance of the individual joint sets is quite different depending on the method of measurement. The rank of joint sets for different measurement methods is as follows: (1) GC – JS 3, JS 1, JS 2, JS 4; (2) manual DOM – JS 1, JS 2, JS 3, JS 4; (3) auto DOM – only one, JS 1 can be clearly defined; (4) satellite TA – JS 1, JS 4, JS 2, JS 3.