

Supplement of

Size, shape and orientation matter: fast and automatic measurement of grain geometries from 3D point clouds

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Figures S1 to S7

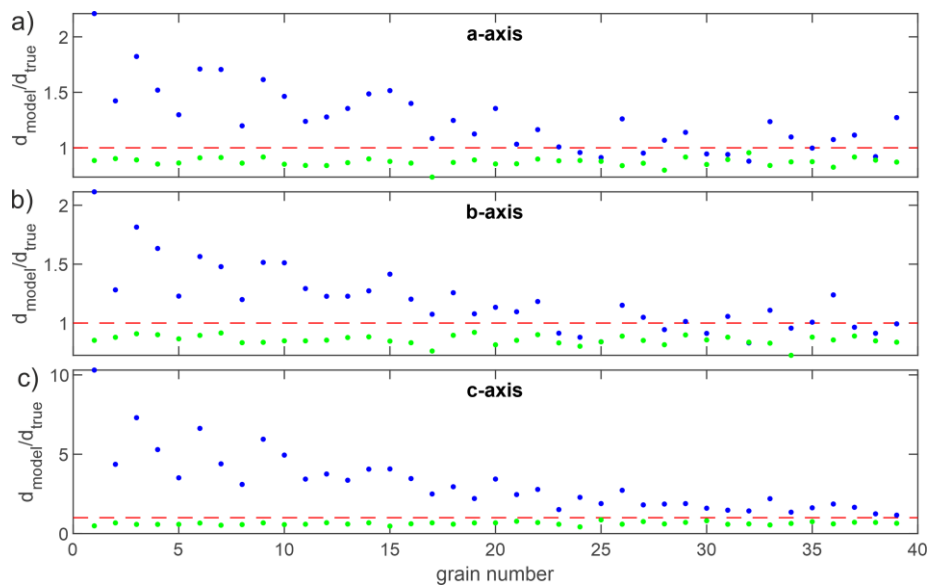


Figure S1. Ratios of the ellipsoid diameters d_{model} over the cuboid lengths d_{true} for the a) a –axis, b) b –axis and c) c –axis of the 39 grains (represented in the same order than in Fig. 4). The horizontal red dashed lines represent the value of 1, while the blue or green dots represent the ratios obtained with the DLSF or IE ellipsoids, respectively.

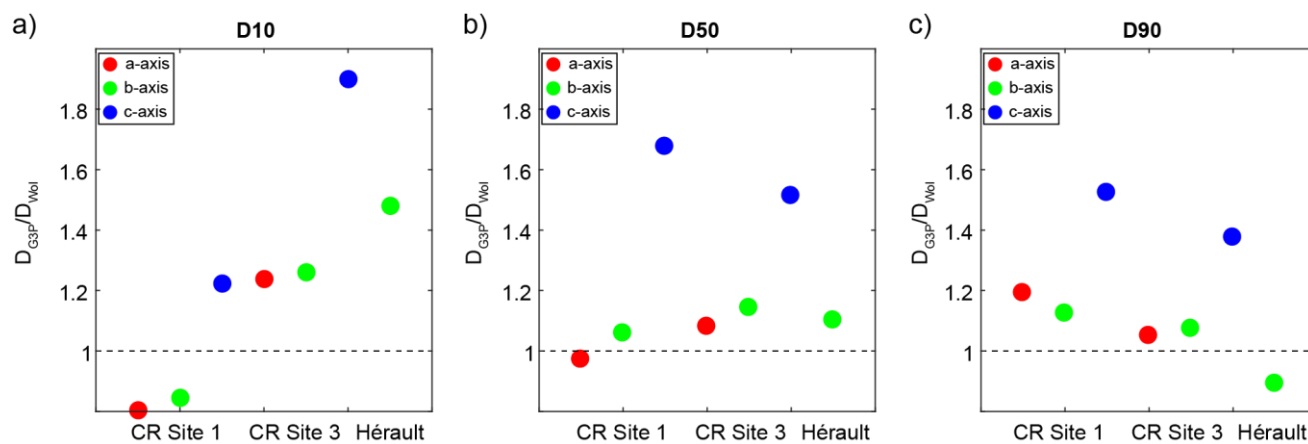


Figure S2: Ratio between the main quartiles (a) D10, b) D50 and c) D90) defined by Wolman counts and by G3Point with only the DLSF fits, according to the sampling sites, for the three grain axis (a-axis: red, b-axis: green, c-axis: blue). A ratio below (above) 1 indicates an underestimation (overestimation) with G3Point with respect to field measurement. The DLSF fit tends to systematically underestimate the quartiles with respect to field counts, for the three axis and for each study site.

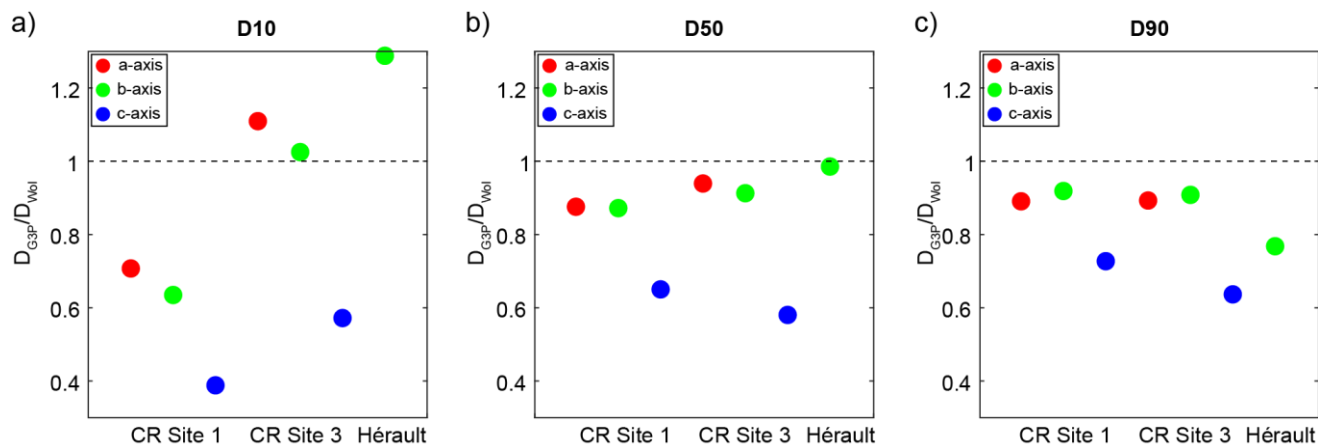


Figure S3: Ratio between the main quartiles (a) D10, b) D50 and c) D90) defined by Wolman counts and by G3Point with only the IE fits, according to the sampling sites, for the three grain axis (a-axis: red, b-axis: green, c-axis: blue). A ratio below (above) 1 indicates an underestimation (overestimation) with G3Point with respect to field measurement. The IE fit tends to systematically underestimate the quartiles with respect to field counts, for the three axis and for each study site.

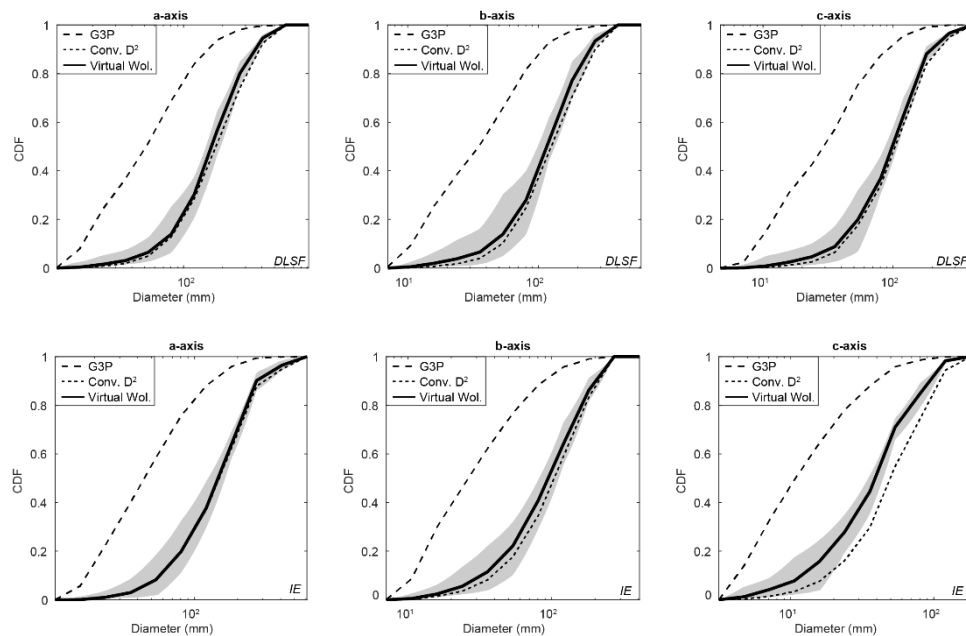


Figure S4: Conversion of G3Point grain-size distribution into a Wolman-like distribution, for Chateau Renard Site 1 and for the two fitting methods (DLSF and IE). The initial G3point distribution is an area-by-number one (large dashed line) that can be converted to a grid-by-number one with a conversion factor of 2 (small dashed line). Alternatively, a virtual Wolman count can be performed on the fitted grains (black line). The shaded envelop indicates the variability observed with 50 realizations.

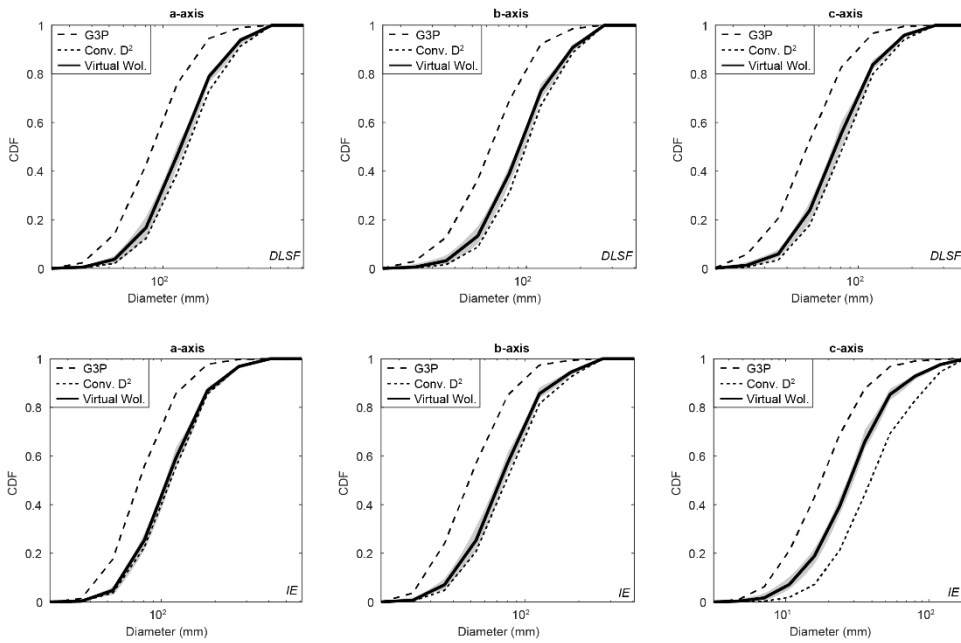


Figure S5: Conversion of G3Point grain-size distribution into a Wolman-like distribution, for Chateau Renard Site 2 and for the two fitting methods (DLSF and IE). The initial G3point distribution is an area-by-number one (large dashed line) that can be converted to a grid-by-number one with a conversion factor of 2 (small dashed line). Alternatively, a virtual Wolman count can be performed on the fitted grains (black line). The shaded envelop indicates the variability observed with 50 realizations.

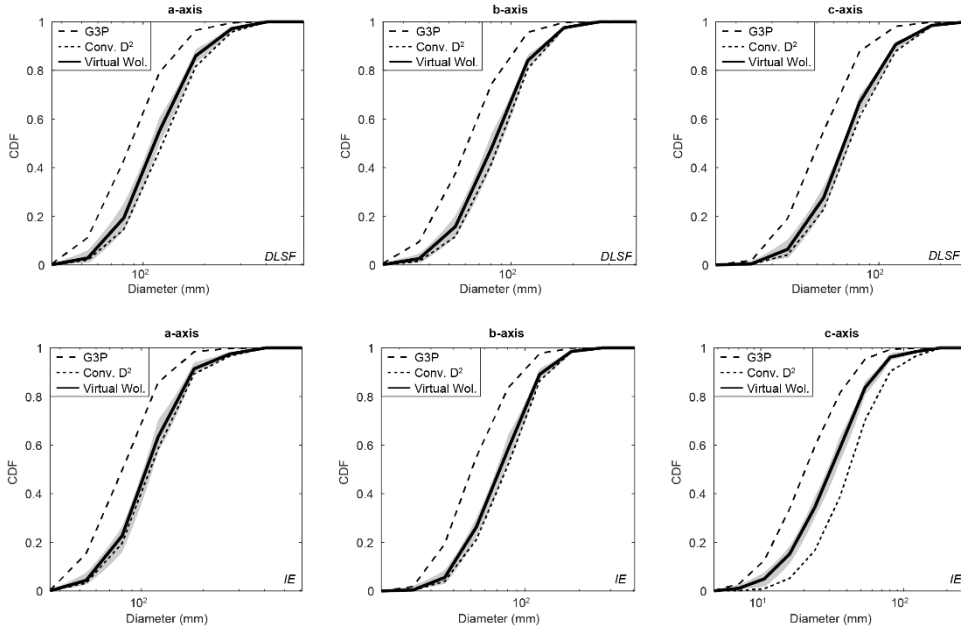


Figure S6: Conversion of G3Point grain-size distribution into a Wolman-like distribution, for the Hérault river and for the two fitting methods (DLSF and IE). The initial G3point distribution is an area-by-number one (large dashed line) that can be converted to a grid-by-number one with a conversion factor of 2 (small dashed line). Alternatively, a virtual Wolman count can be performed on the fitted grains (black line). The shaded envelop indicates the variability observed with 50 realizations.

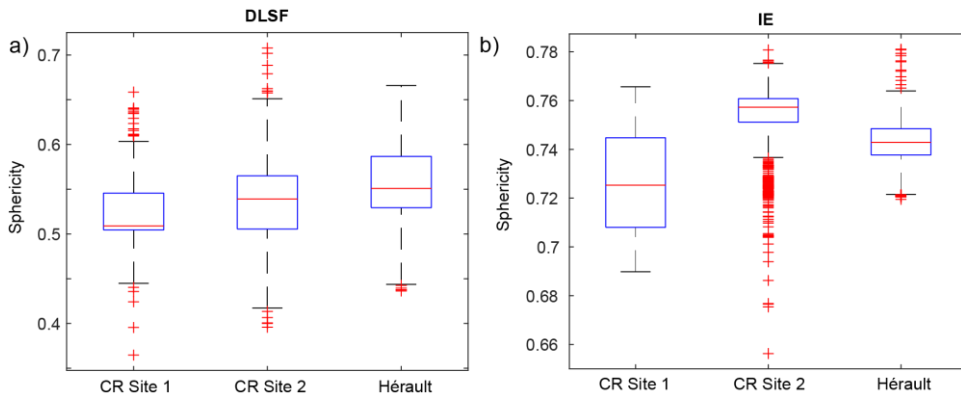


Figure S7: Sphericity of all the grains segmented by G3Point and fitted by a) direct least squared or b) by inertia ellipsoids, for the three study sites. The red line indicates the median value, the box represents 50% of the data and 100% of the data are within the whiskers. Red crosses indicate outliers.