

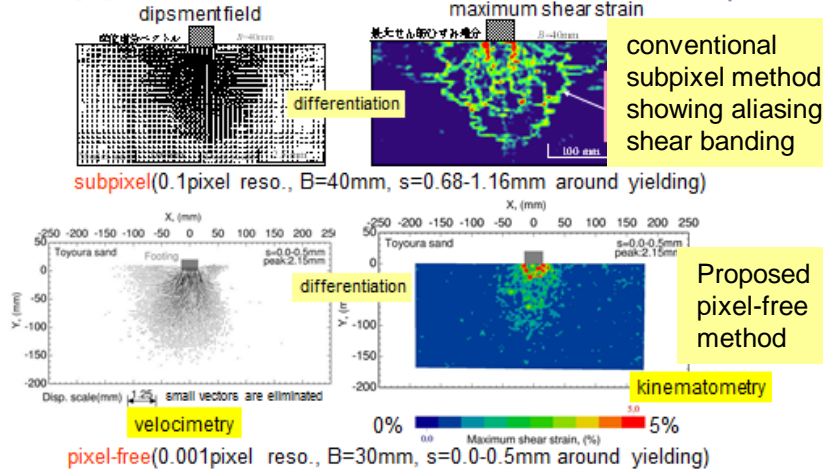


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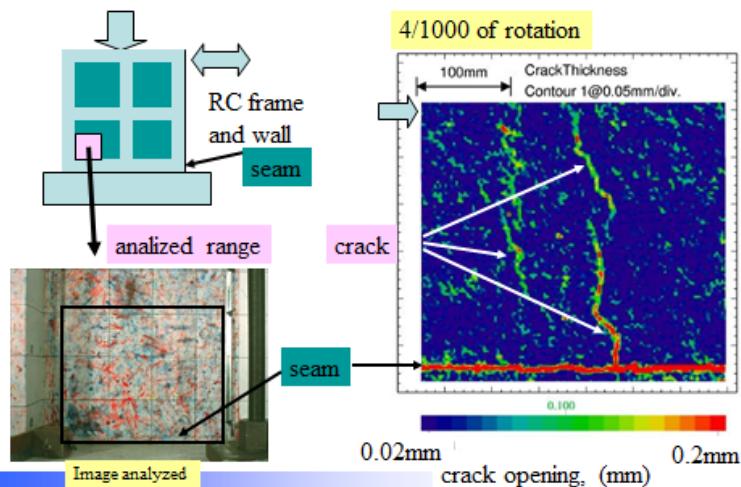
Surface Kinematometry by Pixel-free Image Processing for Geotechnical Model Tests

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Why pixel-free? evidence (1g tests)



Crack opening due to cyclic combined loading



Kinematometry is a newly coined word, which means a method to obtain kinematic information, i.e., movement and deformation, especially strains of geotechnical objects. A new precise matching algorithm was developed. The algorithm provides completed pixel-free measurements, which can eliminate accumulation of errors produced in successive photometry analysis. Errors in strain calculation arising from the discrete structure of conventional raster image data are also avoided by means of this pixel-free algorithm having a 0.001 pixel of resolution.

Accuracy of the algorithm was examined by using both artificially deformed images and actually translated images. The results showed that the errors were less than 0.2 pixels for artificially deformed images within 20% of strain, while 0.05 pixels for translated images.

Figures presented here are examples of the applications: shear banding under strip footing and crack opening in reinforced concrete structures subjected combined cyclic loading.

K. Ueno et al. (2014): Surface kinematometry by image processing for geotechnical model tests, Physical Modelling in Geotechnics, Vol. 1, pp. 337-343, CRC Press.

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