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Pore Scale Characterisation of the Brae Formation sandstones (North Sea, UK)

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In this work, we apply digital rock physics (DRP) to characterise the pore geometries of the Brae Formation sandstones. Core plugs used for image acquisition, subsampled from standard ∼15 cm wide core to 5mm diameter plugs, pertain to two different wells located in the Brae-Miller fields complex (North Sea, UK). Using micro-CT scans at two resolutions, we calculate the porosity, permeability and generate pore network models to assess pore shape characteristics and heterogeneity. The images are filtered and segmented to separate the porosity from grain/matrix. The pore space images are then further processed to calculate the proportion of effective porosity before pore network modelling and the simulation of absolute permeability. The samples display a range in total porosities from 5% to 15% with the connected proportions of the pore space showing only a slight decrease. Pore network model results indicate that the samples have median pore and throat radii ranging from 6 um to 17 um and 6 um to 13 um respectively. The throat length of all samples has a median value ranging between 36 um and 82 um. Absolute permeability simulations highlight that there is anisotropic permeability in all samples.