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Genetic implications of Gold grain morphology in Witwatersrand carbon seam facies: New insights from non destructive 3D X-ray tomography

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Gold in the Witwatersrand placer deposits is associated with several sedimentological facies including the highly mineralized, fibrous carbon seam facies. Gold distribution and genesis has been considered detrital in this and other facies by most researchers for many years. The results of high resolution X-ray micro/nano computed tomography scans of carbon seam from the Carbon Leader reef, Driefontein Gold Mine showed gold grain morphology to be platy (Figure 1) as well as partly tubular and enveloping the asbestiform kerogen fibres. This suggests a cogenetic origin for kerogen and gold derived from auriferous hydrocarbons with no contribution from detrital gold particles.

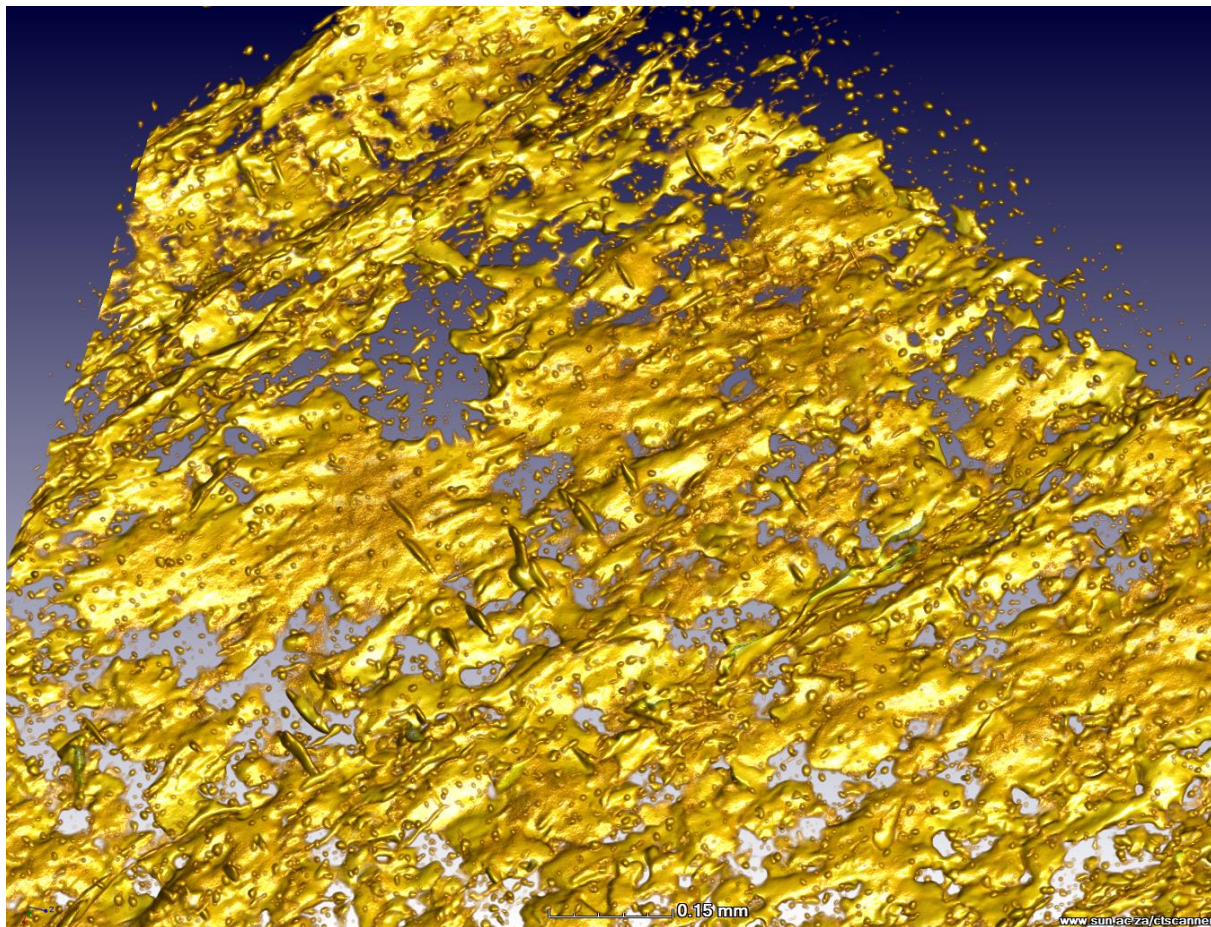


Figure 1: 3D X-ray nanoCT image of platy gold morphology in carbon seam, taken at 1 μ m resolution.

