Automated Change Detection and Oil Field Monitoring Technology Innovation
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Satellite imagery can provide oil and gas operators with specific and cost-effective information relating to operational or environmental changes and oil-field activities, ensuring continuous monitoring, awareness and a fast reaction to potential issues. This paper presents an innovative, state of the art change detection method combining colour, texture and spatial pattern analysis to automatically detect changes and deliver specific, filtered change detection maps. It examines how this new method differs from existing approaches and how its outcomes can significantly reduce image interpretation time. A case study, conducted with SPOT 6 and 7 over the Denver-Julesburg basin oil field in Colorado will be presented to illustrate the automated change detection results and how they may be used to aid change interpretations and provide timely operational support. This case study demonstrates that meaningful changes are detectable with this approach and that unwanted image changes and noise are suppressed. Moreover, the SPOT 6 and 7 sensors are extremely powerful tools for monitoring applications giving wide area coverage (up to 6 million km\textsuperscript{2} daily) and a high spatial resolution of 1.5m improving the power to resolve and interpret changes.