Principles of the IFE Hydrocarbon Core Scanner (HCS™)

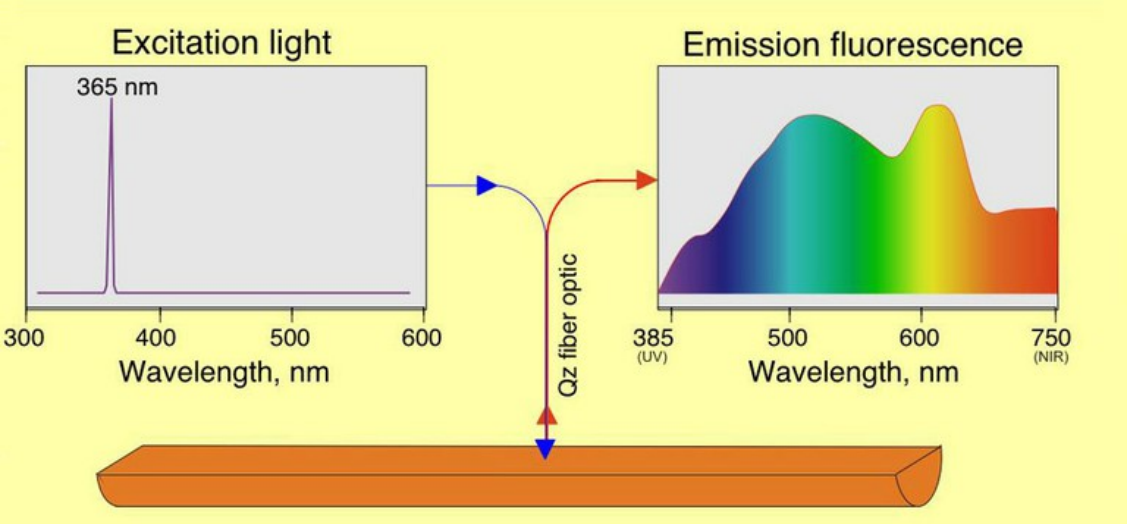

Figure 1
Coherent monochromatic light at a wavelength of 365 nm (excitation) is projected onto a 8 mm spot on a slabbed core using sapphire fiber optics (figure 1); the surface being gently "kissed" by a rubber-lipped pneumatic probehead (figure 2).

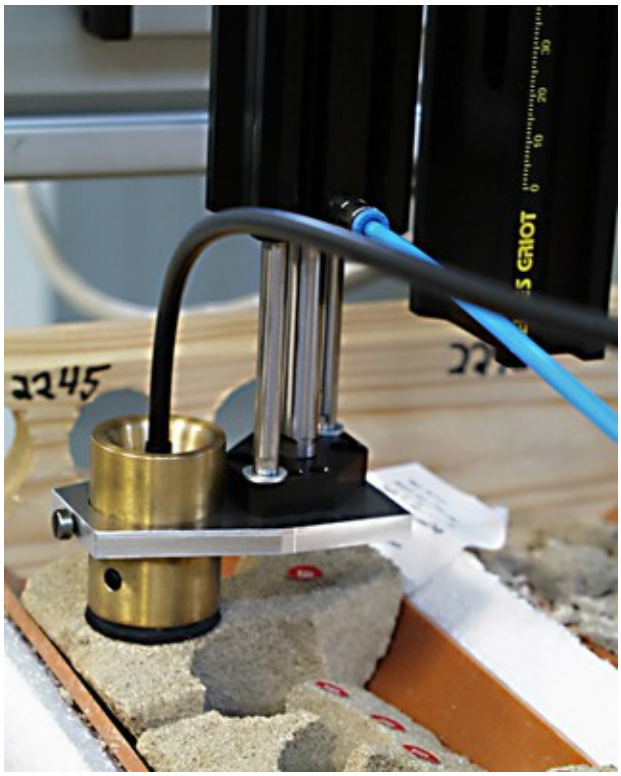

Figure 2. The IFE HCS™ scanner.

This causes any sorbed hydrocarbons to fluoresce, or emit photons at longer wavelengths (emission) in the UV, visible or NIR ranges (380-750 nm). The emission signal is directed through a quartz fiber, by means of a high resolution spectrometer, onto a cooled single photon counting CCD detector and recorded in terms of depth logs of absolute intensity and spectral distribution (Figure 3).

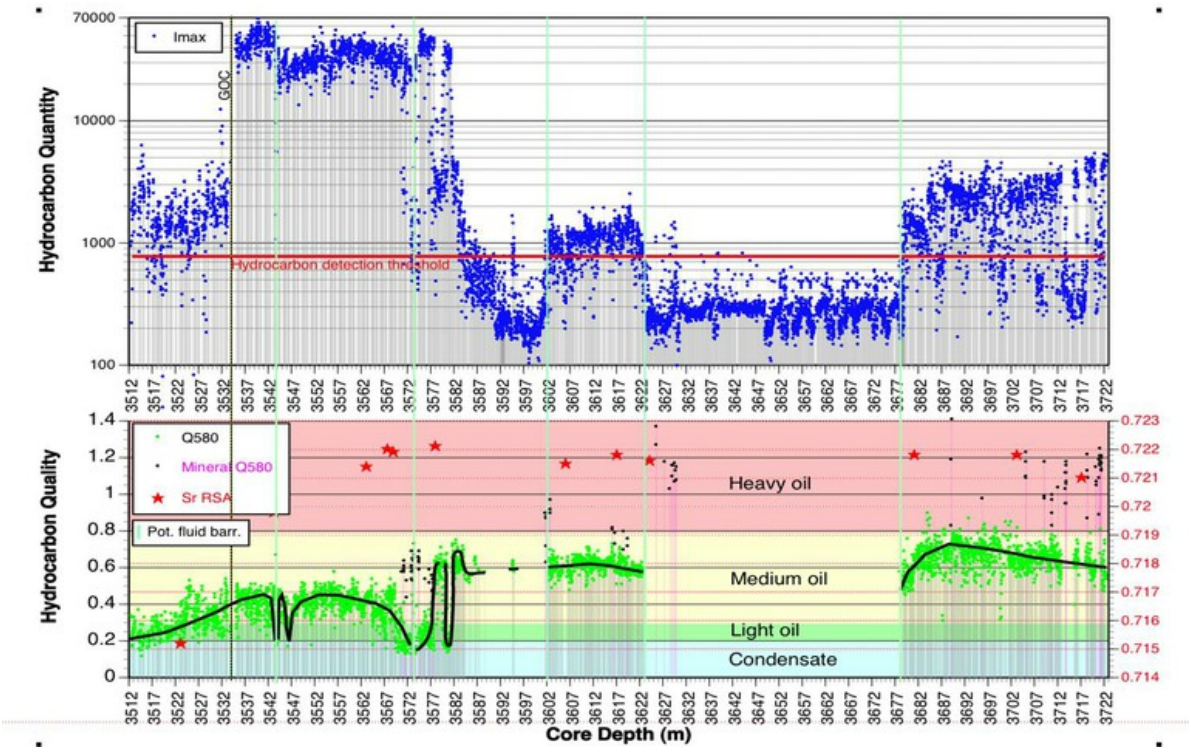

Figure 3: Representative quantitative and qualitative core depth logs generated by the HCS™. I_{max} values (top log) of more than 15000 counts have in numerous cases characterized commercially exploitable petroleum strata. The Q_{580} log (lower log) gives instant high resolution information on subtle changes in overall petroleum compositions ranging from condensates to asphaltene-rich oils. Joined together the I_{max} and the Q_{580} logs readily pinpoint the potential of fluid barriers, compartmentalization, GOC and OWC contacts.

Contact person: Jan Kihle, Senior Geologist, Department of Environmental Technology; jaki@ife.no