# From lab to farm: monitoring grape maturation and vine hydric stress with integrated optical sensing and and IOT technologies

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Abstract

Within the H2020 I GRAPE project (https://i-grape.eu), integrated microspectrometers ( from 400nm to 1500nm), front end and communication hardware, and optical data analysis models are being developed to monitor diffuse reflectance and fluorescence response from grapes and leaves. Grape maturation parameters ( for example titratable acidity , potential alcohol, total polyphenols) as well as water potential in the leaf are being evaluated. The optical microspectrometer assembles chip level LEDS, integrated photodiodes ( either a-Si:H or CMOS) with bandpass filters, with discrete front end electronics ( or an ASIC). This optical head is placed inside the grape bunch or below the leaf. The analog front end involves both LED drivers and photodiode readout electronics ( at ASIC level). The communication module uses a LORA protocol to transfer data from the vineyard to a gateway then sending the information via internet to the server. First real time data is being assessed this season.