

# VEGETATION INDEX MAPPING OVER A VINEYARD FROM AN ALTERNATIVE LOW-COST PLATFORM

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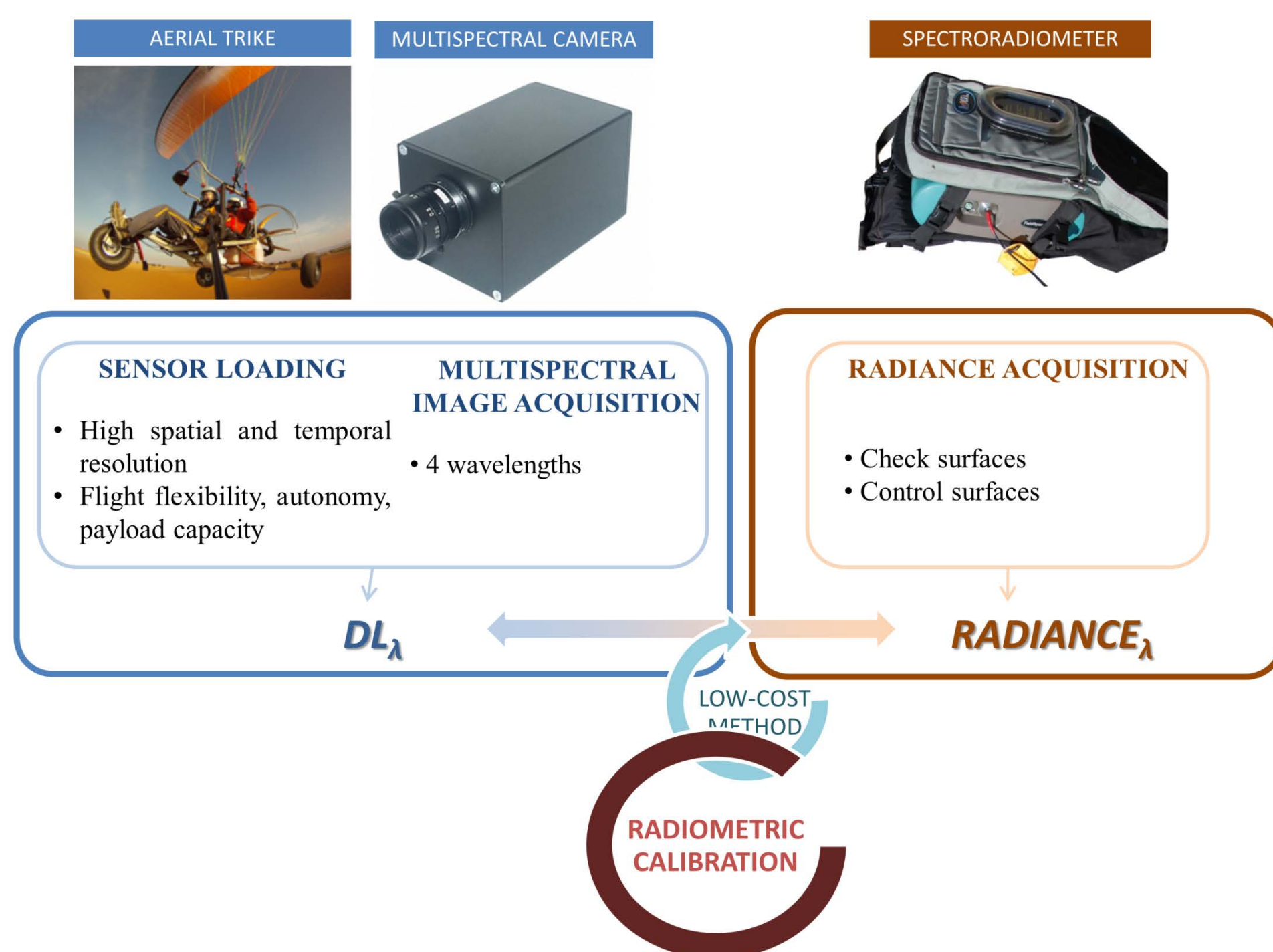
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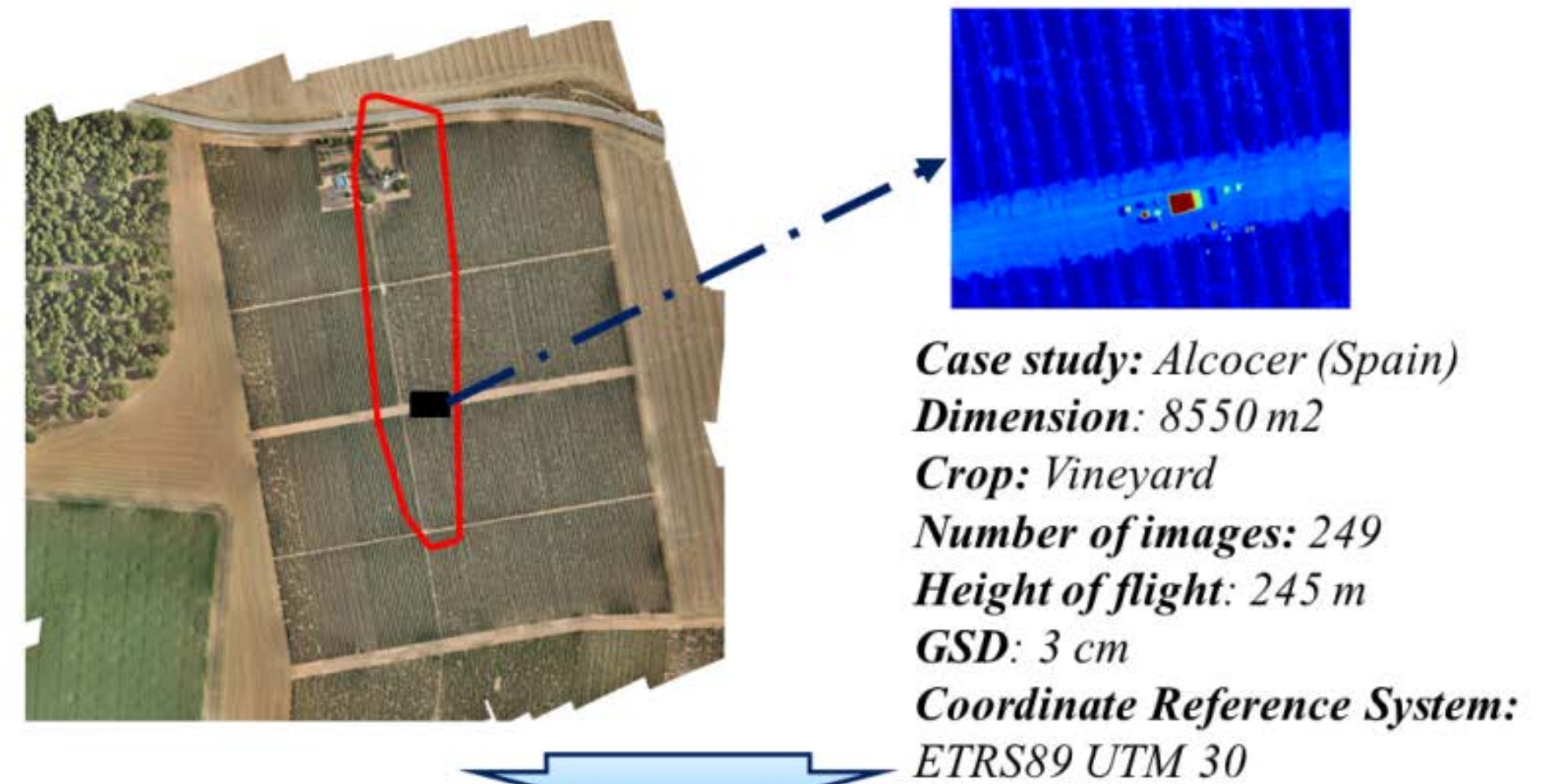
## 1. Highlights

Low-cost manned aerial platforms serve as a new remote sensing tool capable to assist in decision making for the sustainable management of extensive vineyard areas. In this case a powered paraglider trike was chosen, providing a great flexibility to quickly perform viticultural mapping in high spatial, temporal and spectral resolution using an onboard Condor MS4 multispectral camera with four bands (Red-Green-Blue-NIR).

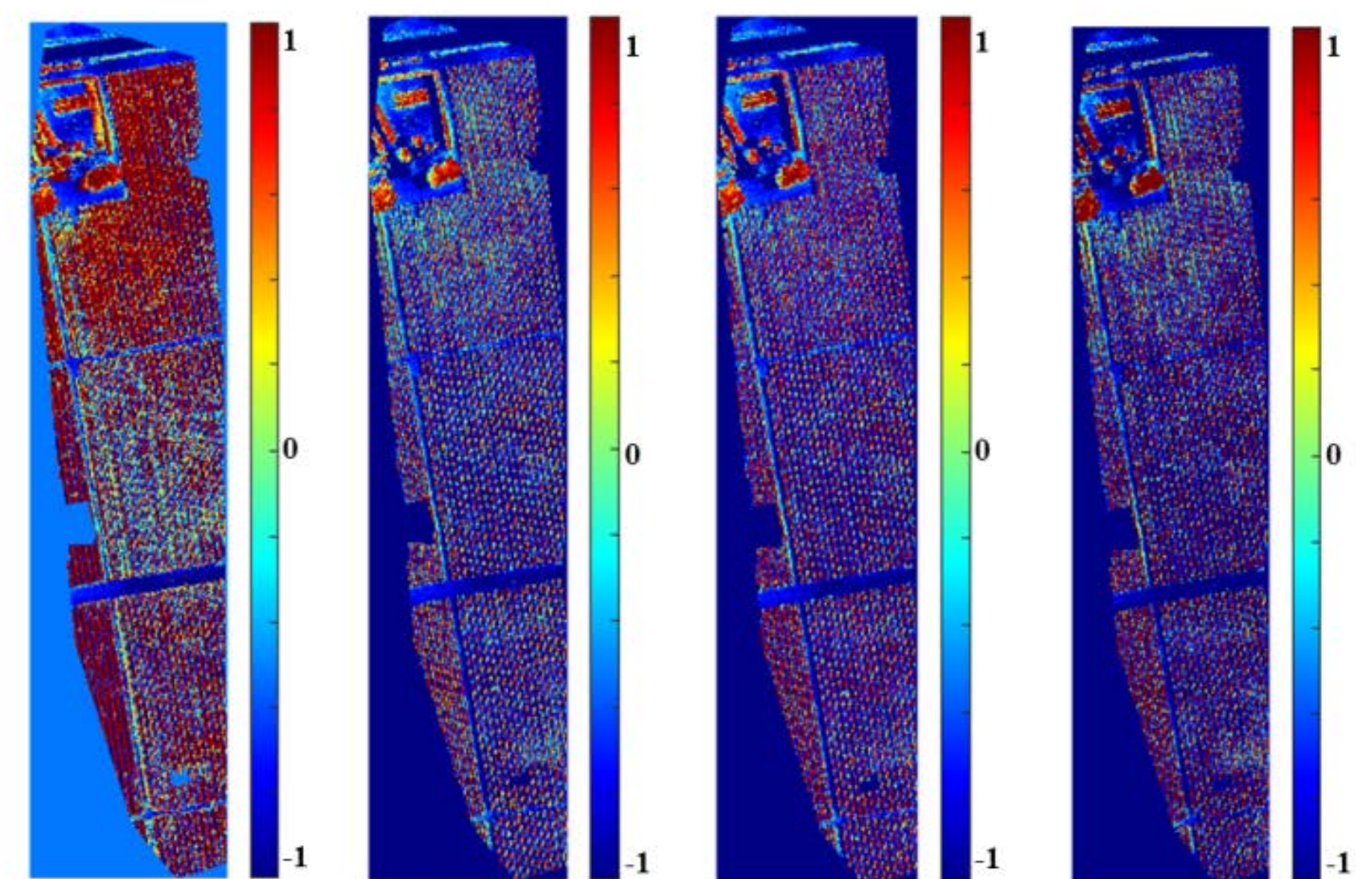
## 2. Materials & Methods



## 4. VI Mapping



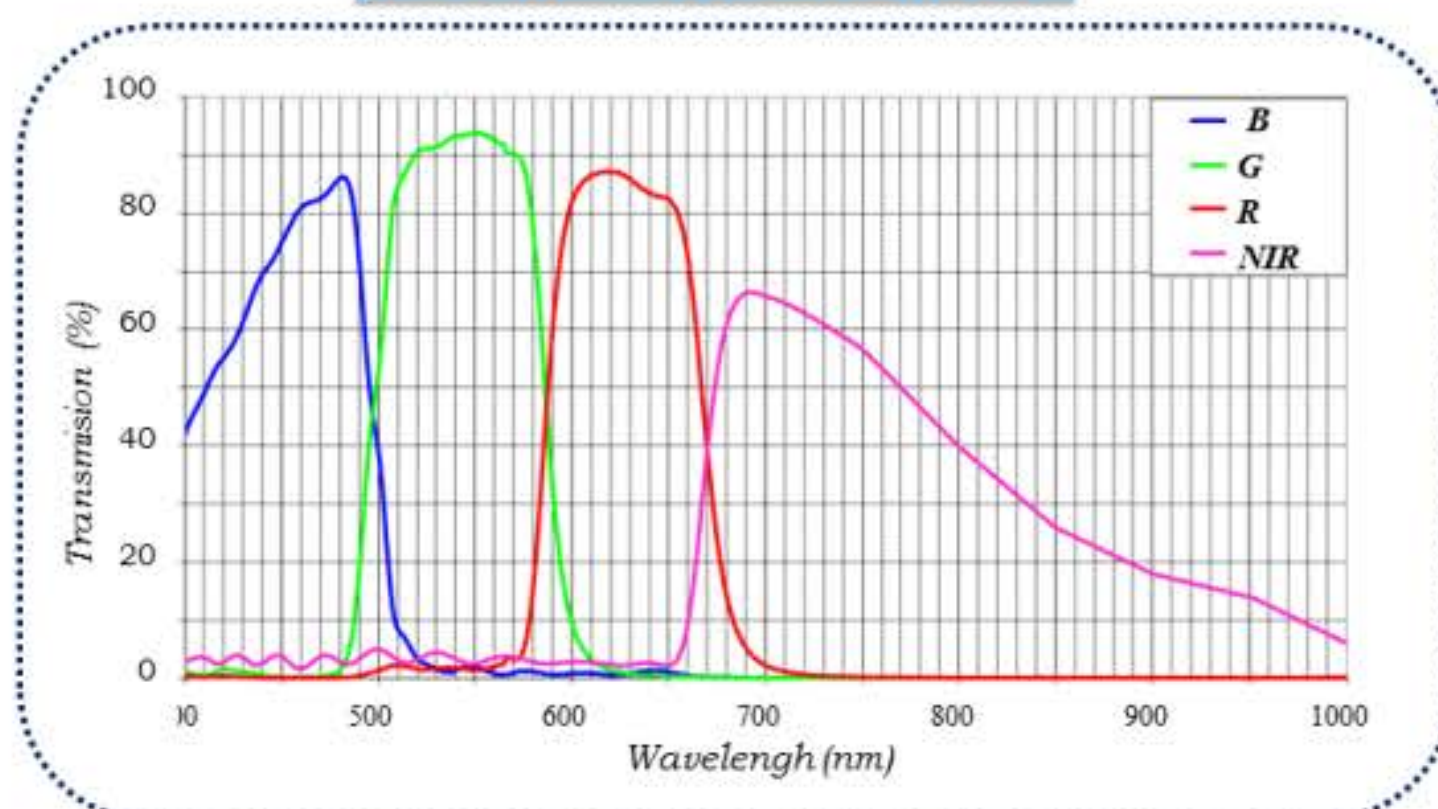
$$NDVI = \frac{NIR - R}{NIR + R}; \quad SAVI = \frac{(NIR - R)(1 + L)}{(NIR + R + L)}; \quad MSAVI = \frac{2NIR + 1 - \sqrt{(2NIR + 1)^2 - 8(NIR - R)(NIR - R)(1 + L)}}{2}; \quad GESAVI = \frac{(NIR - a)(R - b)}{R}$$



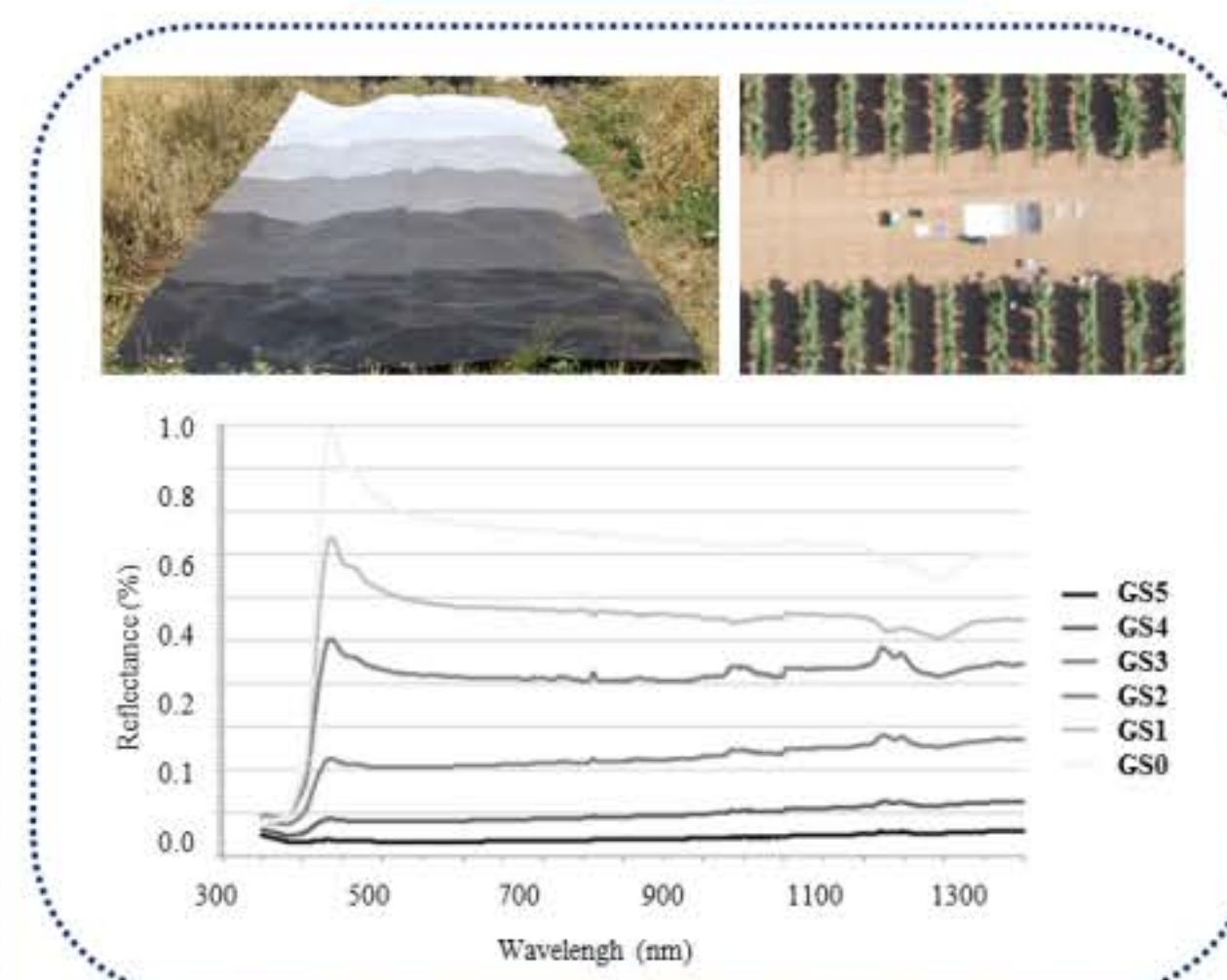
## 3. Calibration Results

- Control surfaces: grey scaled tarps
- Spectroradiometer measurements
- Filter specifications of the sensor
- Insignificant atmospheric effects (6S radiative transfer model)

### 2. CONDOR-1000 MS4-VN-285

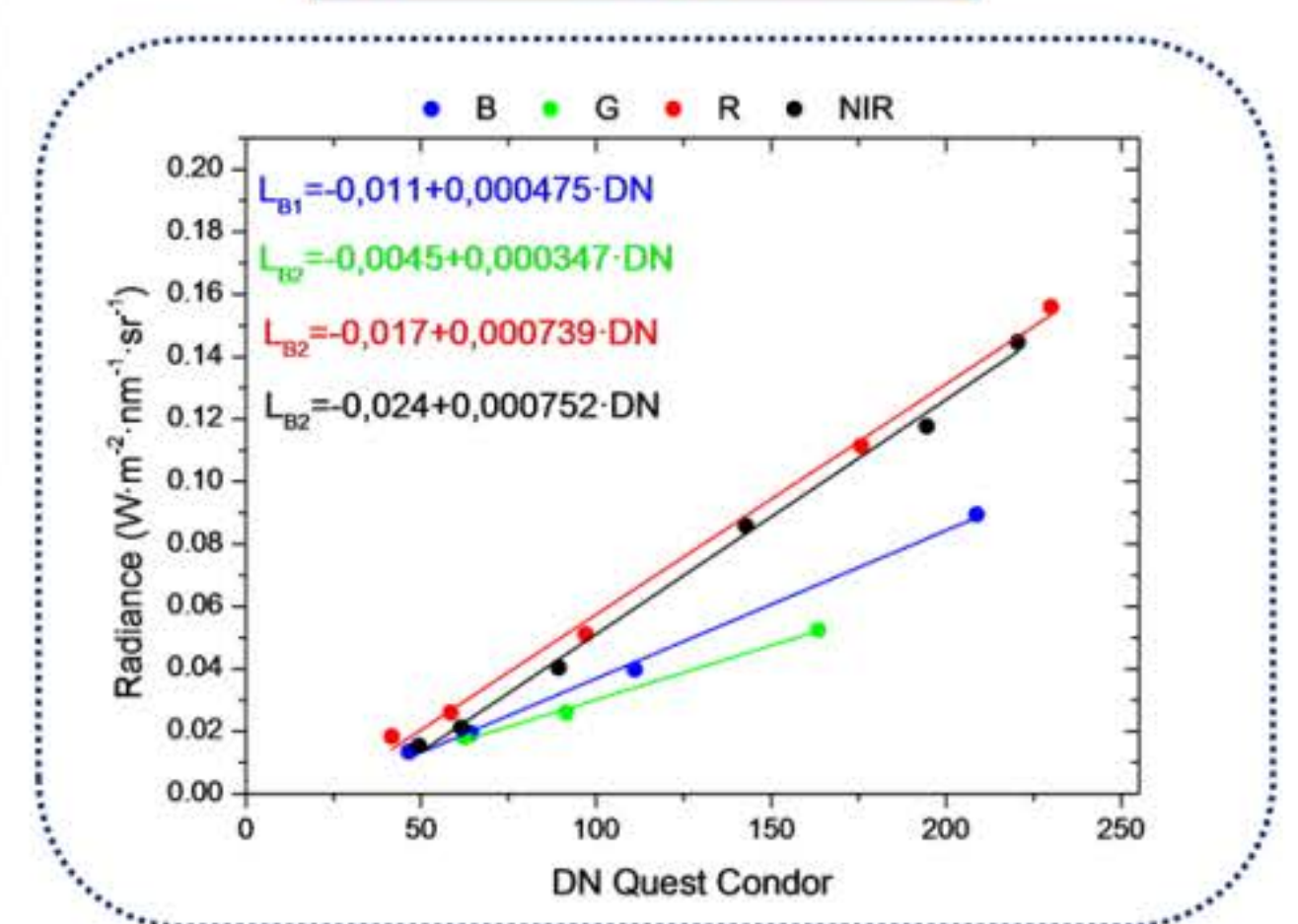


### 1. Field data acquisition



- Method based on radiance
- Linear model
- 4 independent bands
- System solved by Danish Method

### 3. Radiometric calibration



## 5. Conclusions

This research proves the great potential of low-cost remote sensing platforms to collect multispectral images for precision viticulture applications. Moreover, the proposed framework through close-range photogrammetric techniques demonstrates that it is highly feasible to generate quantitative mapping products such as vineyard VI maps to crop assessment.

