

The CloudSpec - A New Spectroscopic Tool for Analysis of Unfiltered Ferments

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Introduction

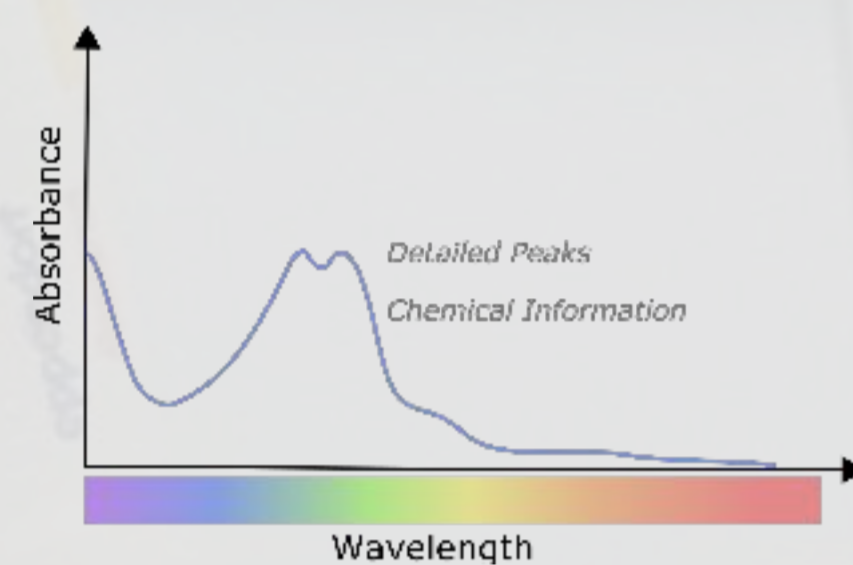
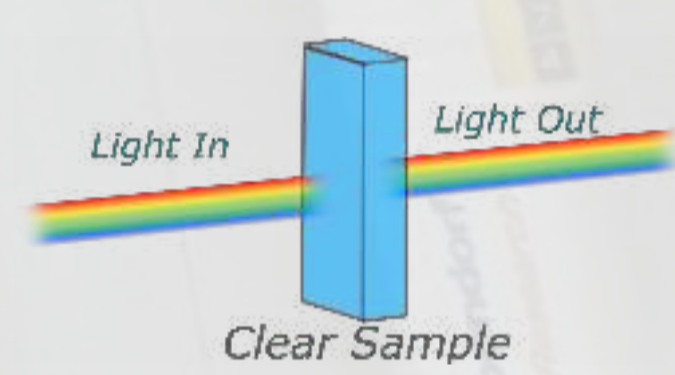
- Sample turbidity poses a challenge for rapid and simple assessment of phenolic and colour extraction during red fermentation.
- The cost and time to filter fermentation samples prior to measurement via UV-Vis spectroscopy has limited the adoption of colour and phenolic assessment.
- The *CloudSpec*, developed by New Zealand startup MaramaLabs, is a ground-breaking UV-Vis spectrometer designed to measure turbid liquids without the requirement to filter samples.
- The instrument eliminates the effects of sample turbidity, allowing classic measurements of A280, A520, colour density and hue to be performed with ease during fermentation.



The Problem & The Solution

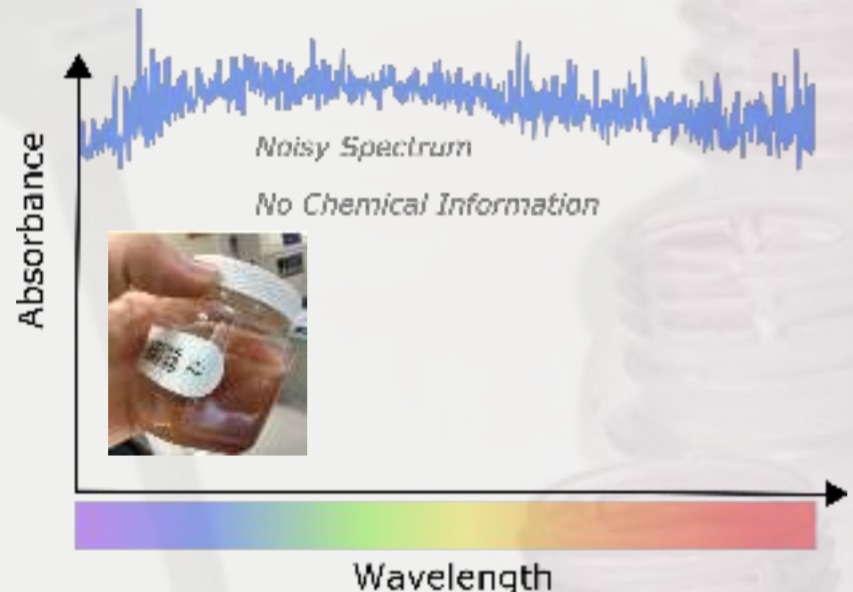
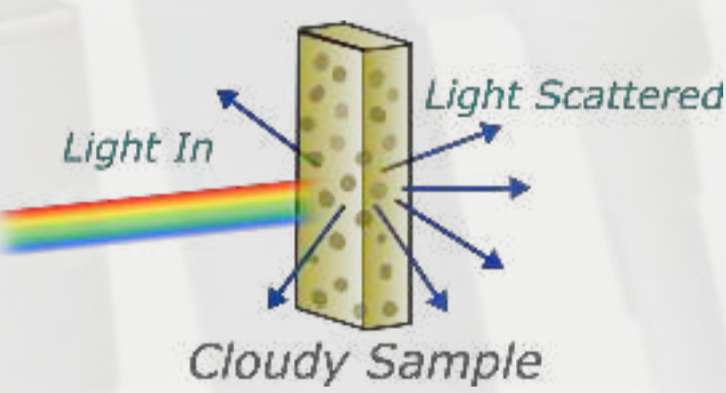
UV-Vis Spectroscopy

Clarified samples



- Provides detailed spectral information
- Used in wines for assessing:
 - Total Phenolics (A280) [1]
 - Colour (A520)
 - Tannins
 - Hue

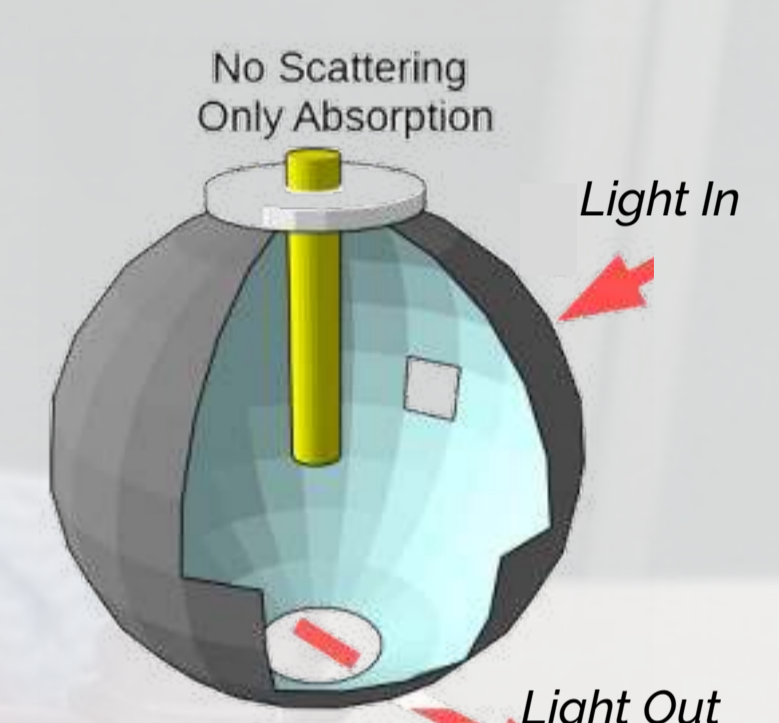
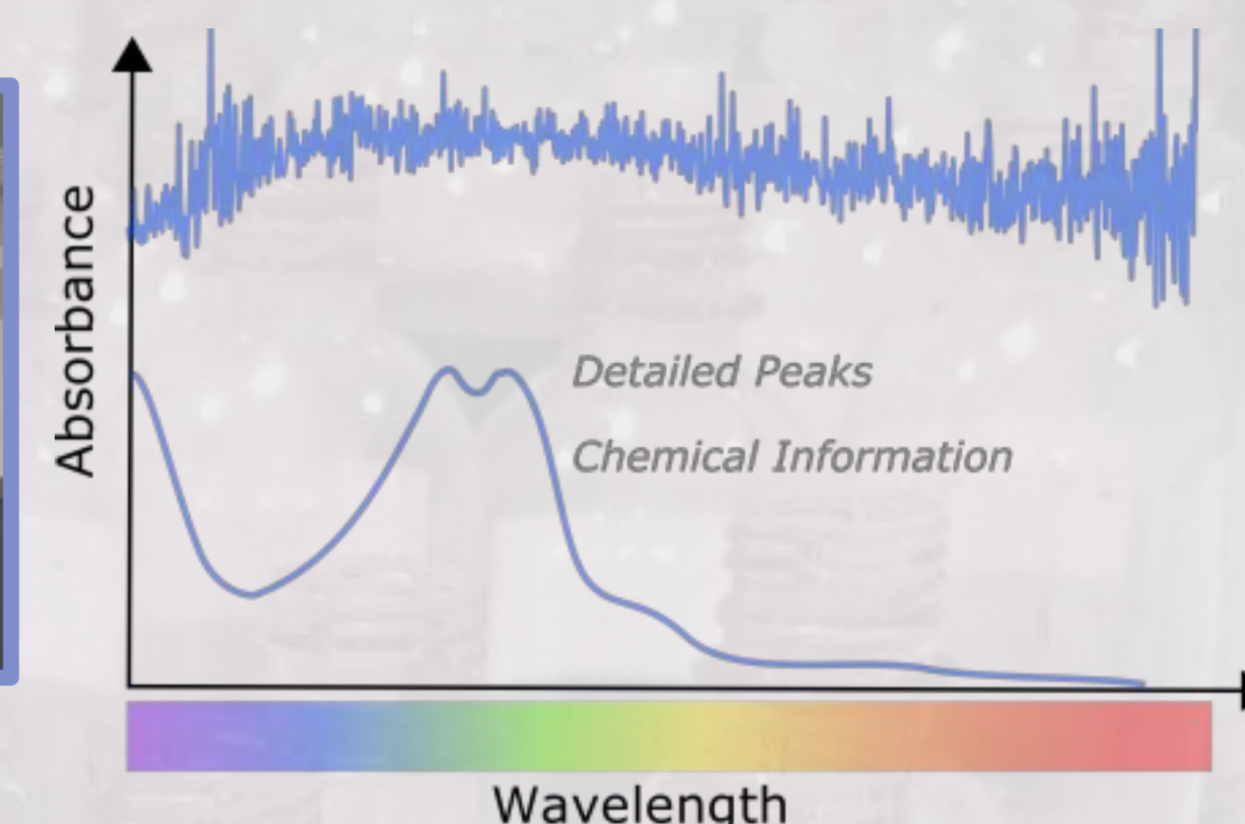
Real ferments



- Turbidity hides spectral information
- Results become noisy / unreliable
- Filtering or centrifuging required
- Time-intensive preparation

→ Samples must be clear!

The CloudSpec - A New Era for UV-Vis



- The CloudSpec (shown above) can accurately measure turbid samples
- Uses "integrating sphere" technology to separate scattered and absorbed light
- No filtering or centrifuging of samples is required before measuring
- Covers the full UV-Vis range from 250nm-850nm

Vintage '19 Commercial Trials

Overview



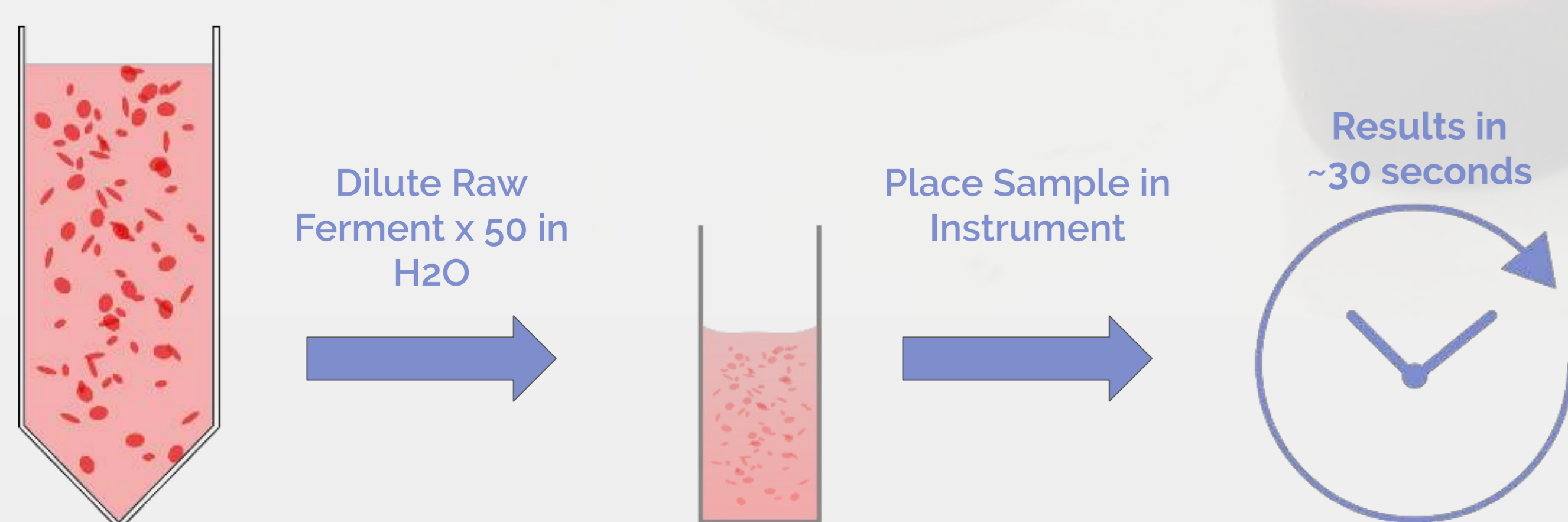
Measurement Summary	
Samples assessed	> 3000
Fermentations assessed	> 200
Average samples p/day	50
Styles	6
Regions	8



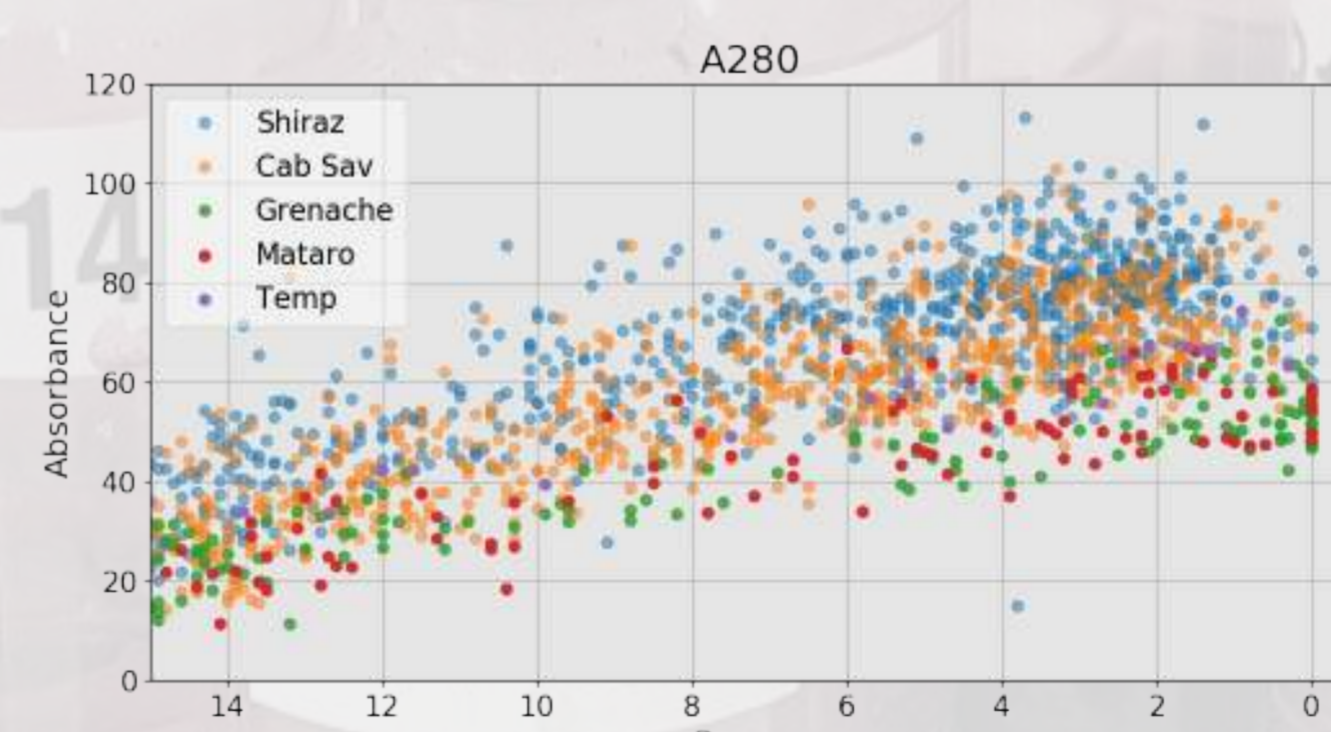
Trial Goals

- Validate technology in commercial vintage
- Monitor fermentations for colour & phenolics
- Generate information to support winemaking decisions

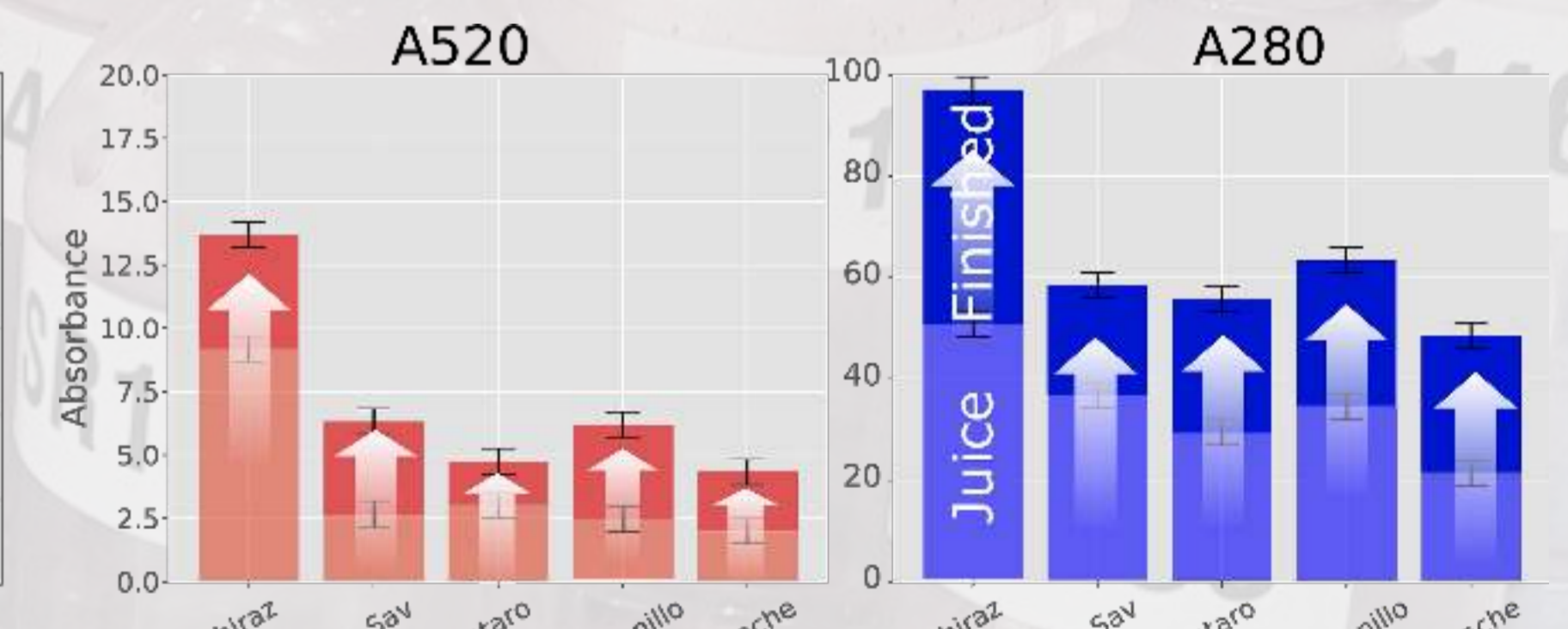
Method



Varietal Variation SR1

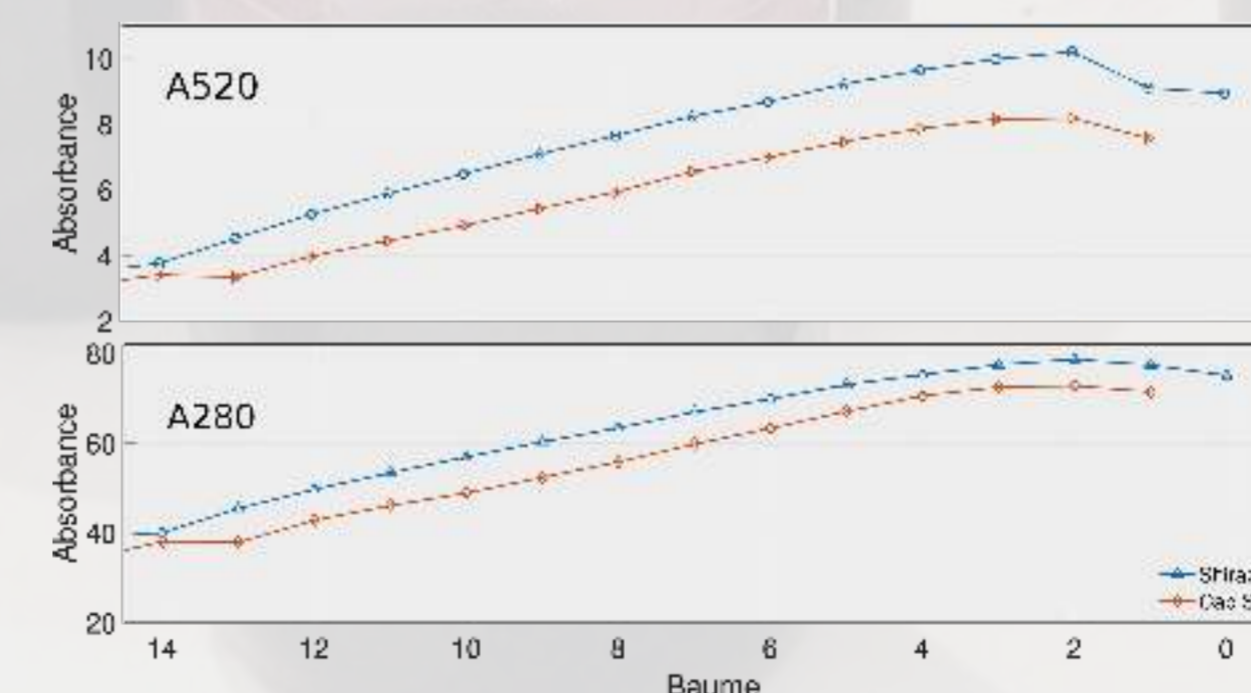


A280 vs Baume for the entire vintage data-set, color-coded by variety

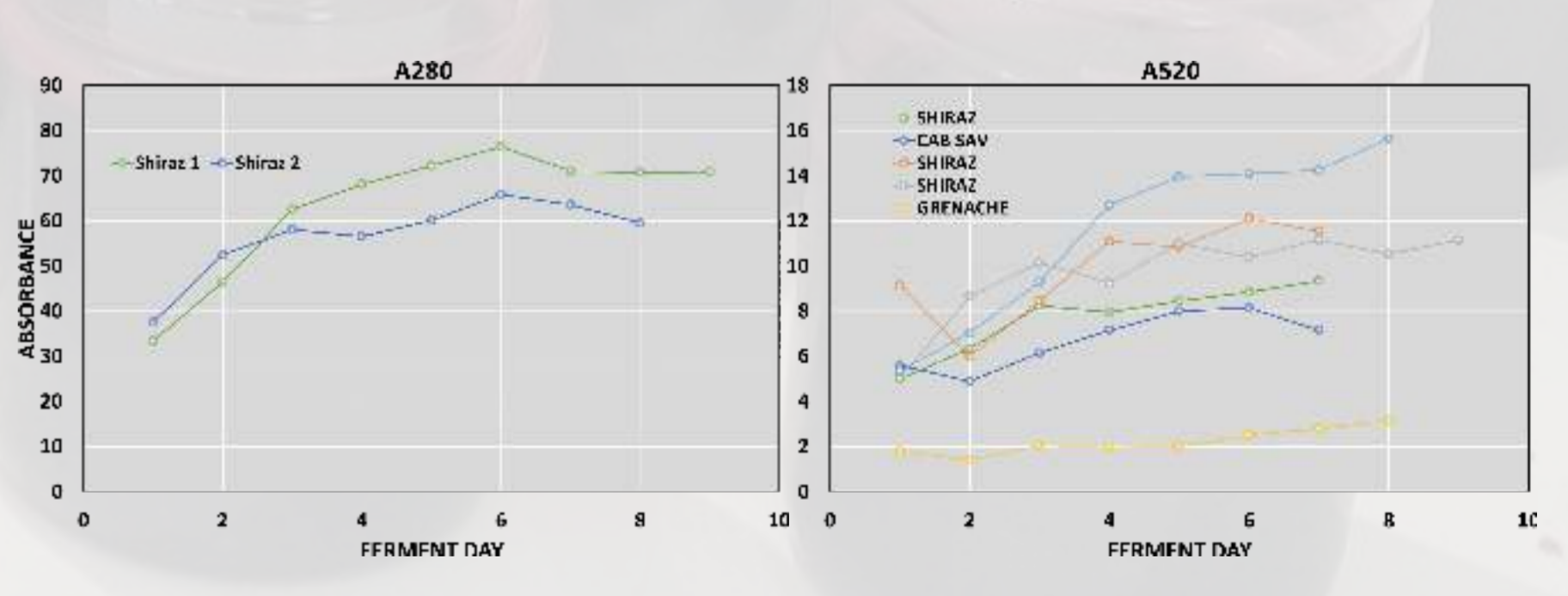


Typical starting and finishing values for total colour (left) and total phenolics (right) of different varieties

Tracking Ferments



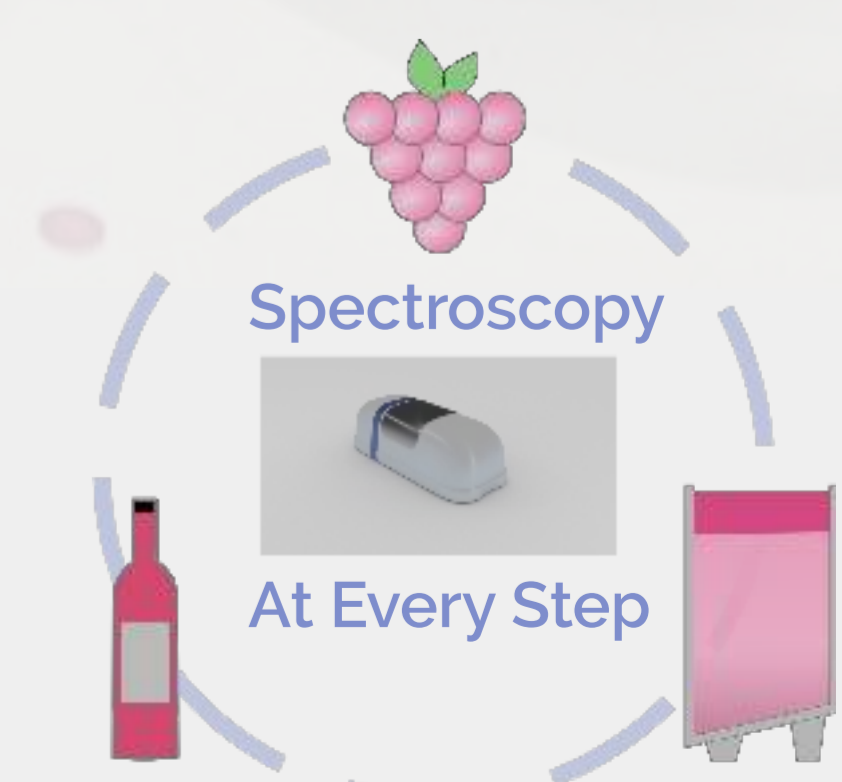
Averaged extraction curves for A520 and A280 of Shiraz and Cabernet Sauvignon ferments vs Baume



Examples of phenolic & colour ferment extraction-curves for some individual batches, highlighting the differences observed within a variety (left) and across a number of varieties (right)

Conclusions

- Vintage '19 trials demonstrate the efficacy of the CloudSpec for assessing colour & phenolics of ferments in a commercial setting.
- The CloudSpec can be used to monitor phenolic & colour evolution of ferments from juice to post-press.
- Implementation of the CloudSpec in winery laboratories will support winemaking decisions in managing red fermentations.



References

[1] Somers, T.C and Ziemelis, G. 1985. Spectral evaluation of total phenolic compounds in *Vitis vinifera*: Grapes and Wine. *J. Sci. Food Agric.* 36:1275-1284.

Contact

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