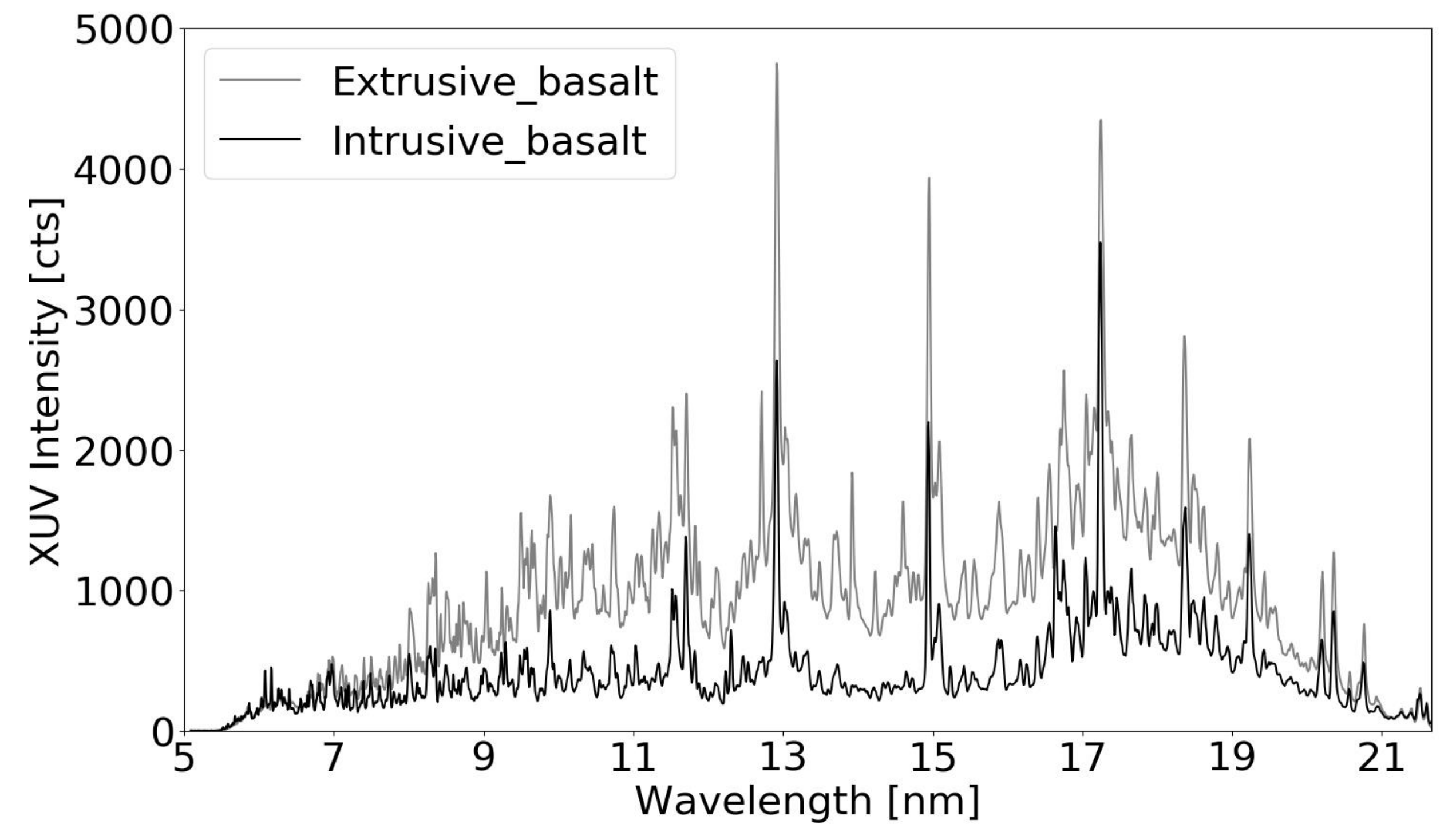
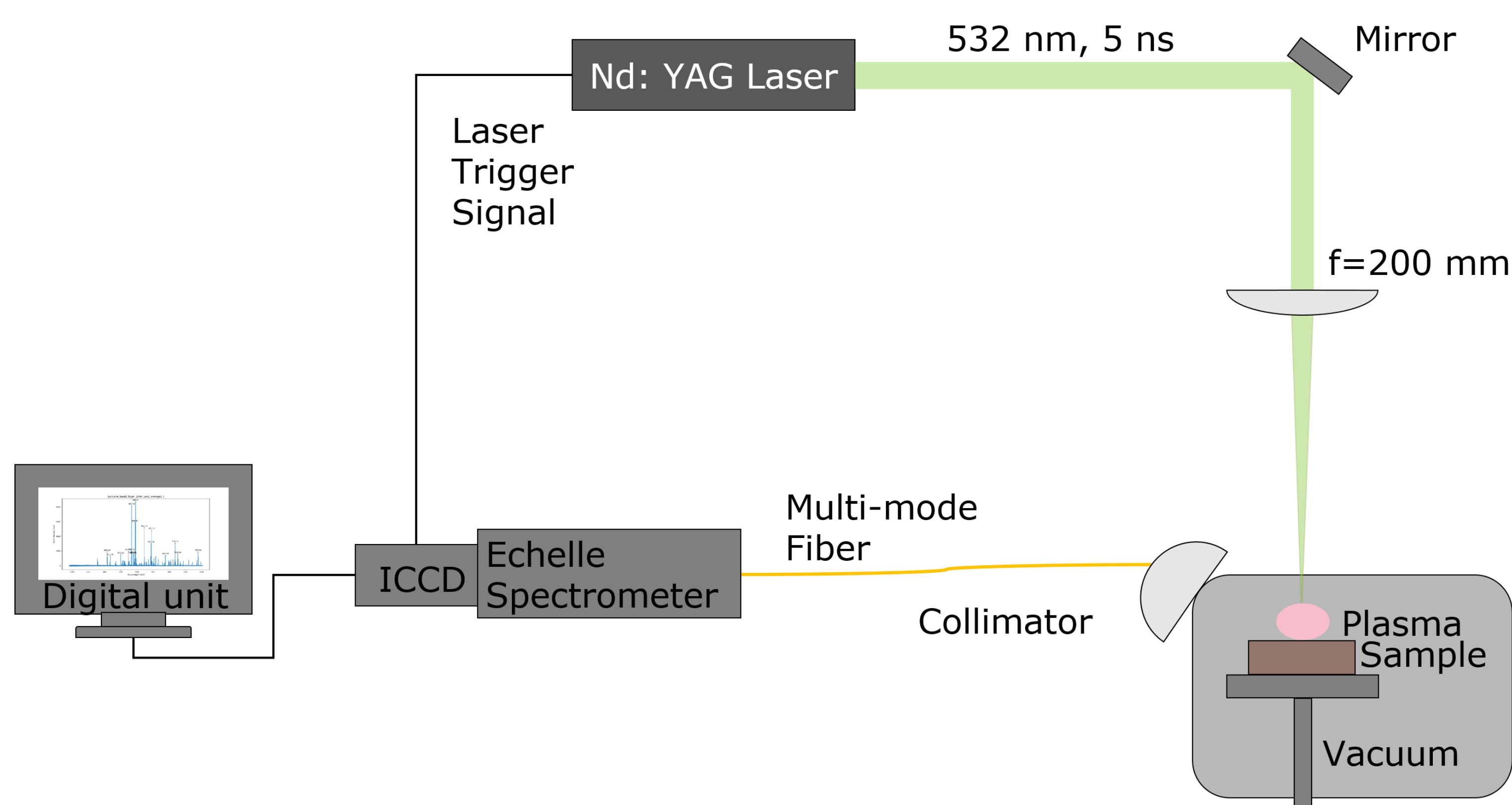
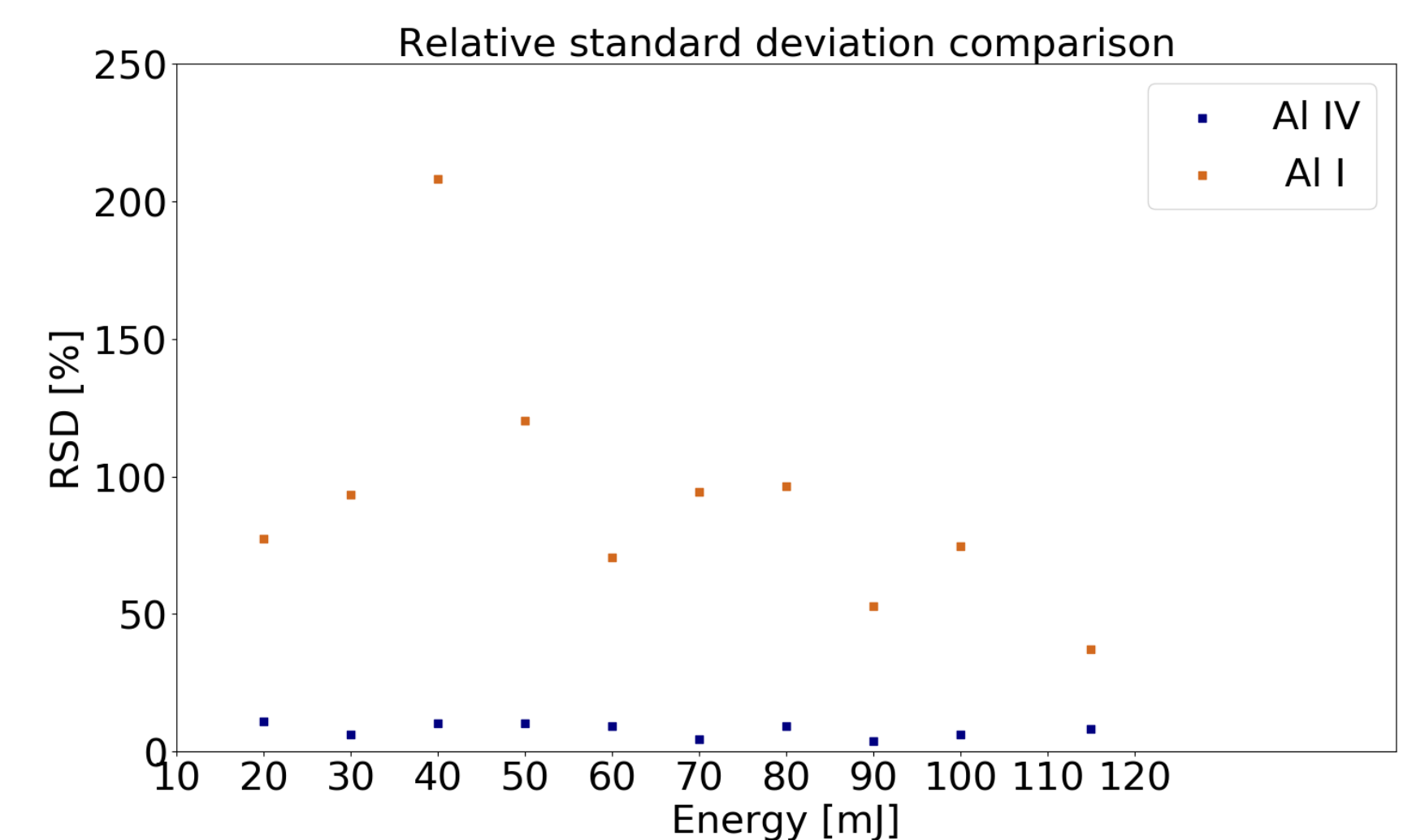
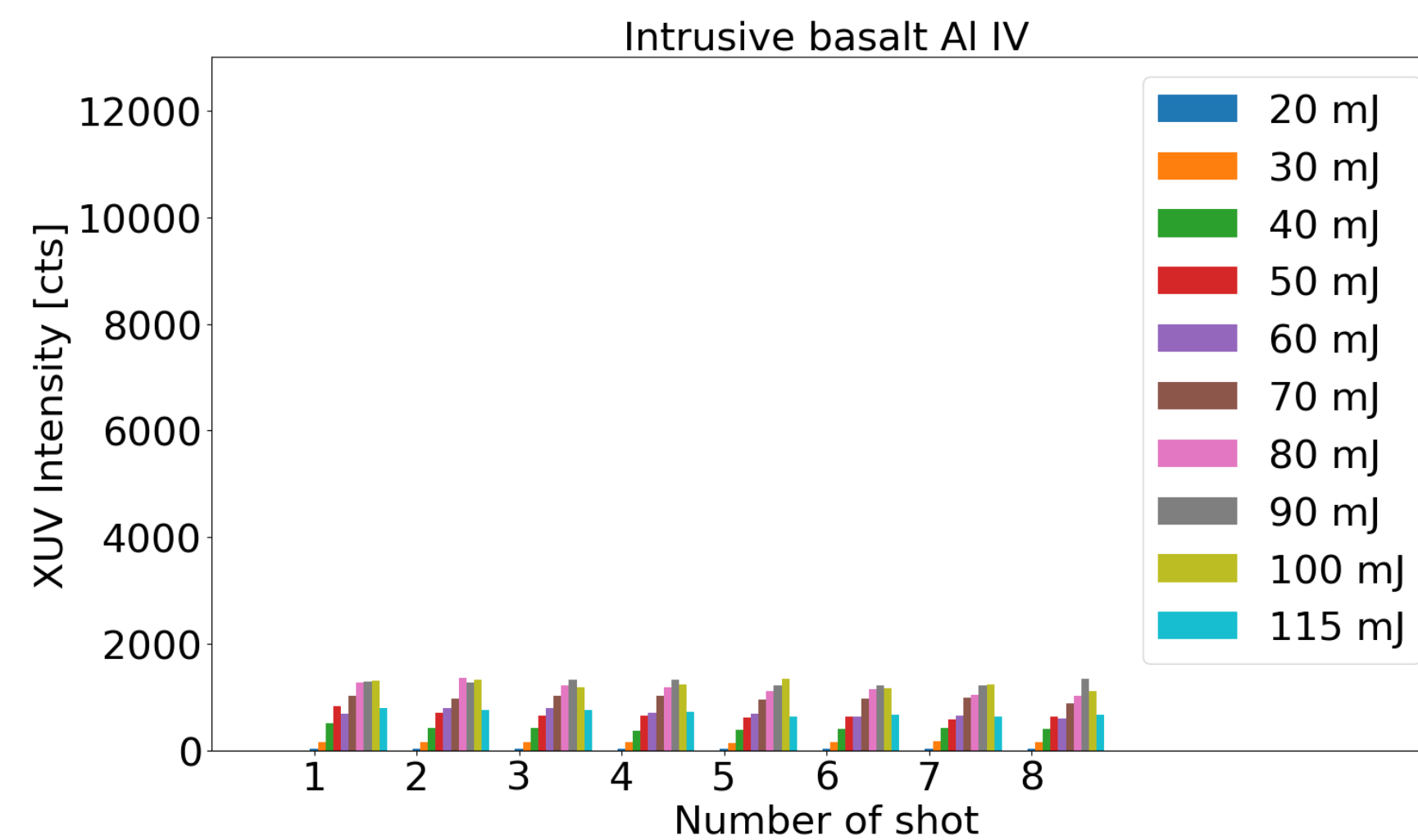
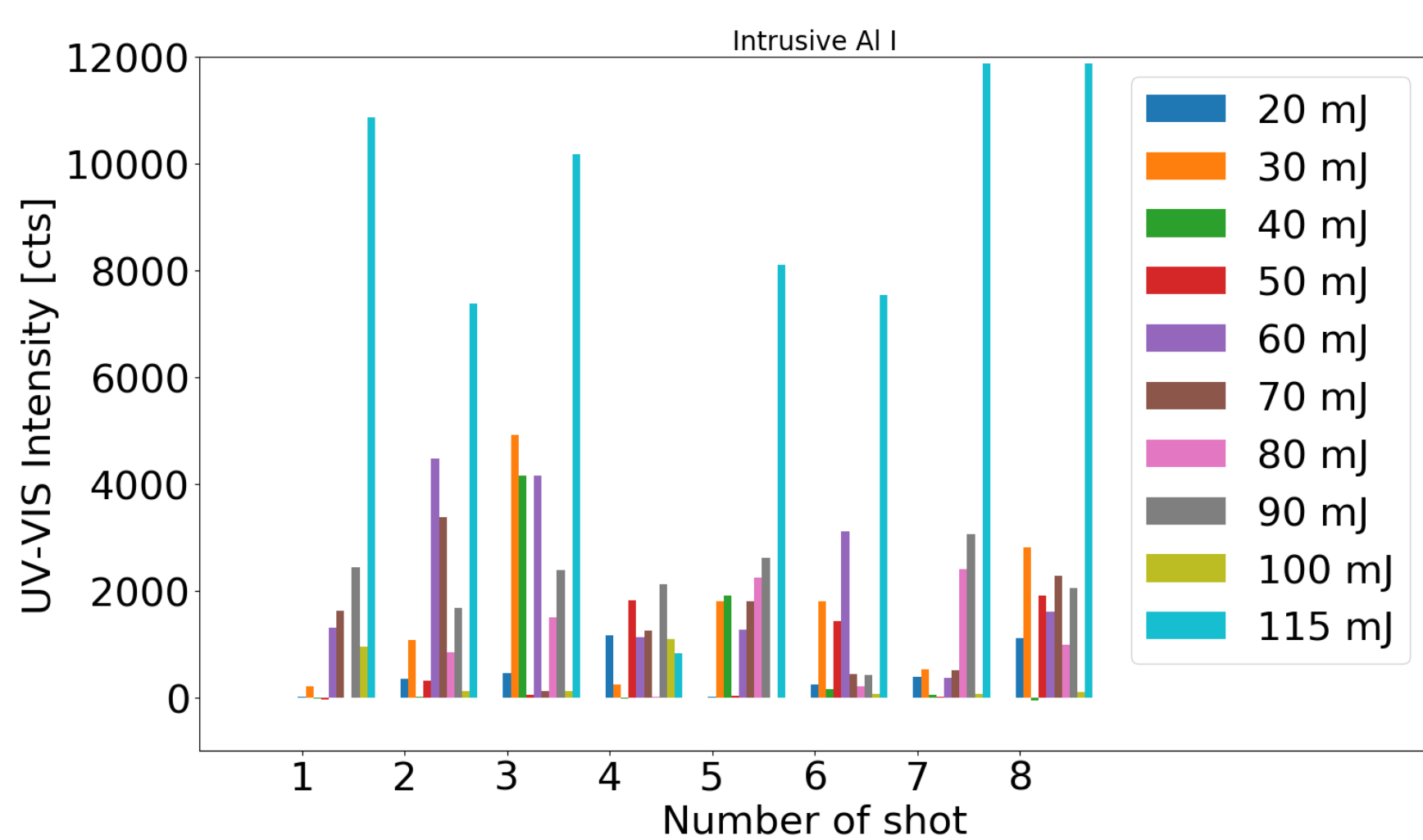


Elemental microanalysis of lunar analog materials



LIXS spectrum of extrusive (grey) and intrusive basalt (black)

LIXS consists of Nd:YAG Laser, focus lens and flat-field XUV spectrograph build by Qu et al.



Repeatability of LIBS and LIXS measured on intrusive basalt for Al I and Al IV at different energies

Problem

Space exploration has been a thriving field since Neil Armstrong stepped on the moon in 1969. Elemental detection methods are already being applied on moon. The aim of this project is to disclose the benefits of laser-induced soft X-ray and extreme ultraviolet spectroscopy (LIXS), which is an evolution of laser-induced breakdown spectroscopy (LIBS) for space applications.

Methods

A direct comparison of both methods is enabled by simultaneously detecting the emission spectrum of lunar analogue samples. Elemental detection and precision measurements are performed on spectra obtained from LIBS and LIXS.

Results

LIXS, as an evolution of LIBS, benefits from low noises, much better repeatability and better reproducibility than LIBS.

However, wavelength shifts impede the attribution to the corresponding elements and the deviations from equilibrium conditions lead to uncertainties in calculated temperatures.

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