

Near UHP conditions for the Syros amphibole-zoisite eclogites established

Stamatis Flemetakis, UoA

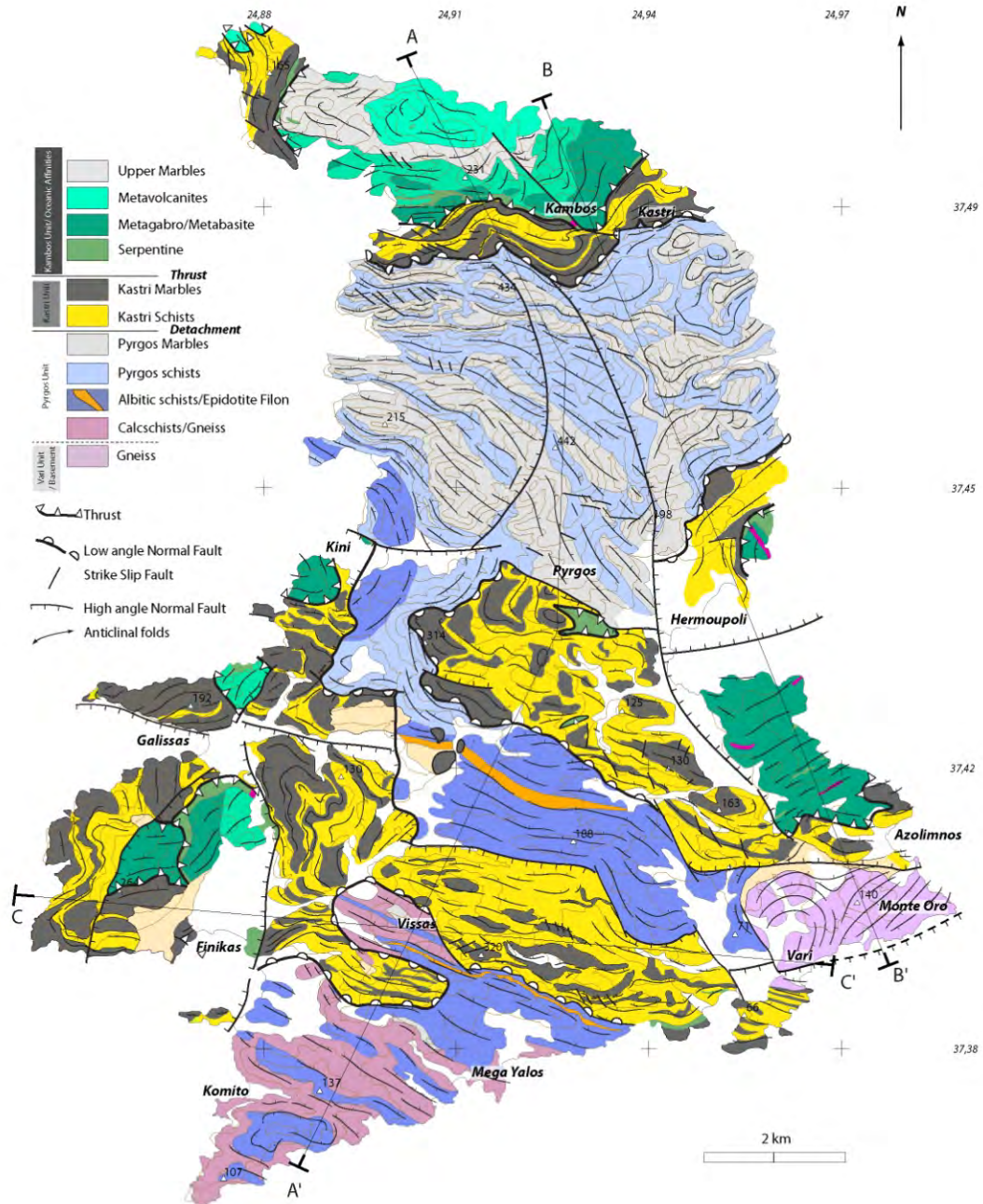
Evangelos Moulas, ETH Zurich

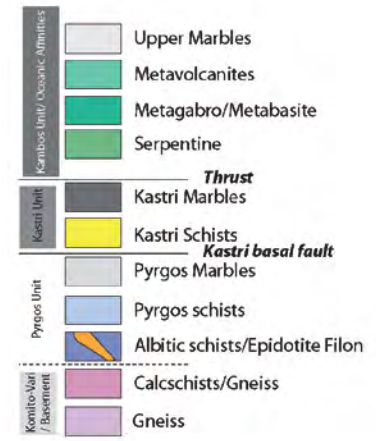
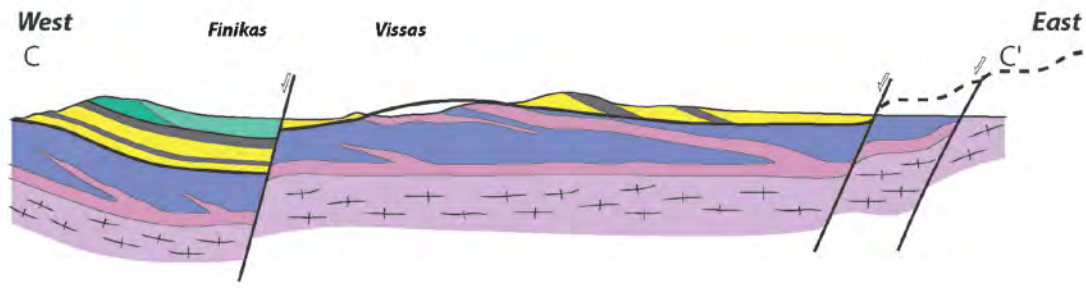
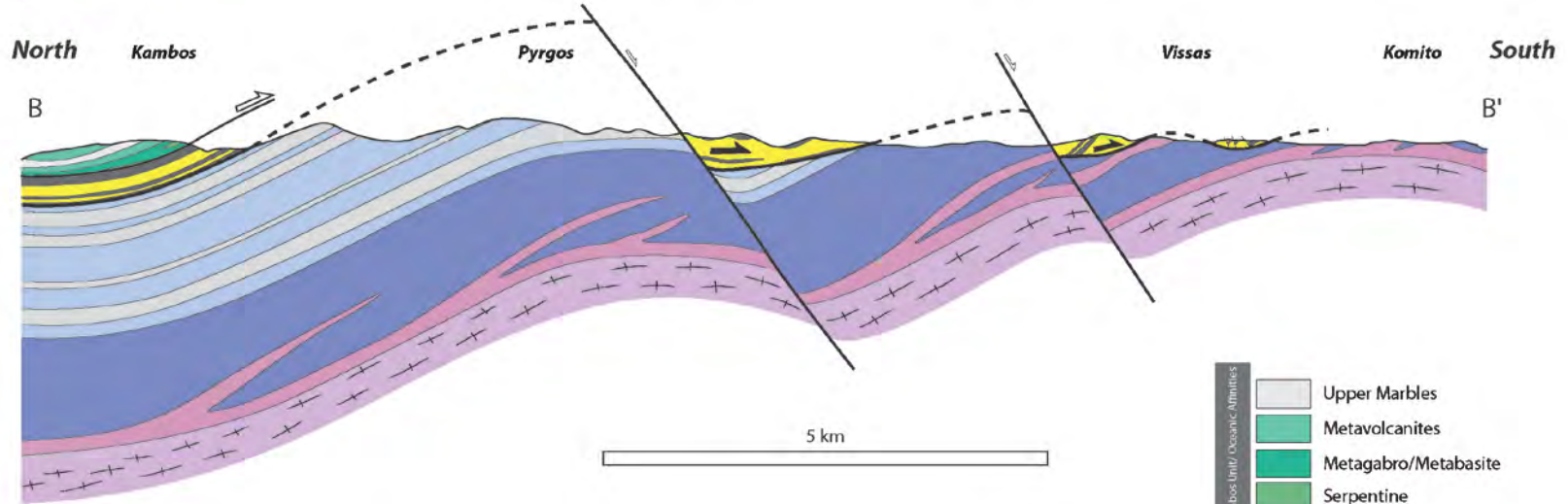
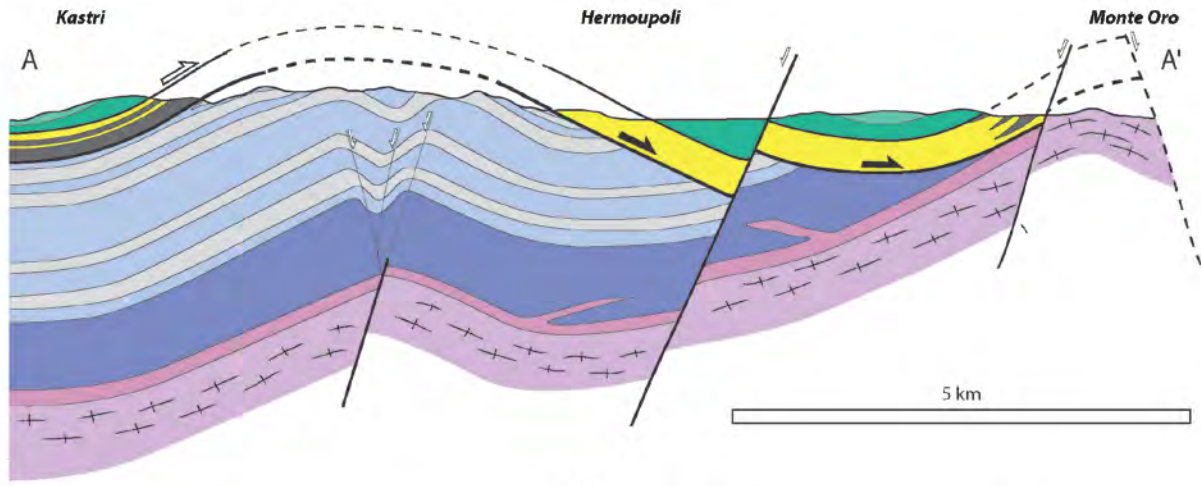
Dimitrios Kostopoulos, UoA

Elias Chatzitheodoridis, NTUA

Geological Society of Greece, Annual Scientific Session,
1 April 2013, Athens, Greece

Geology and cross-sections





Petrology

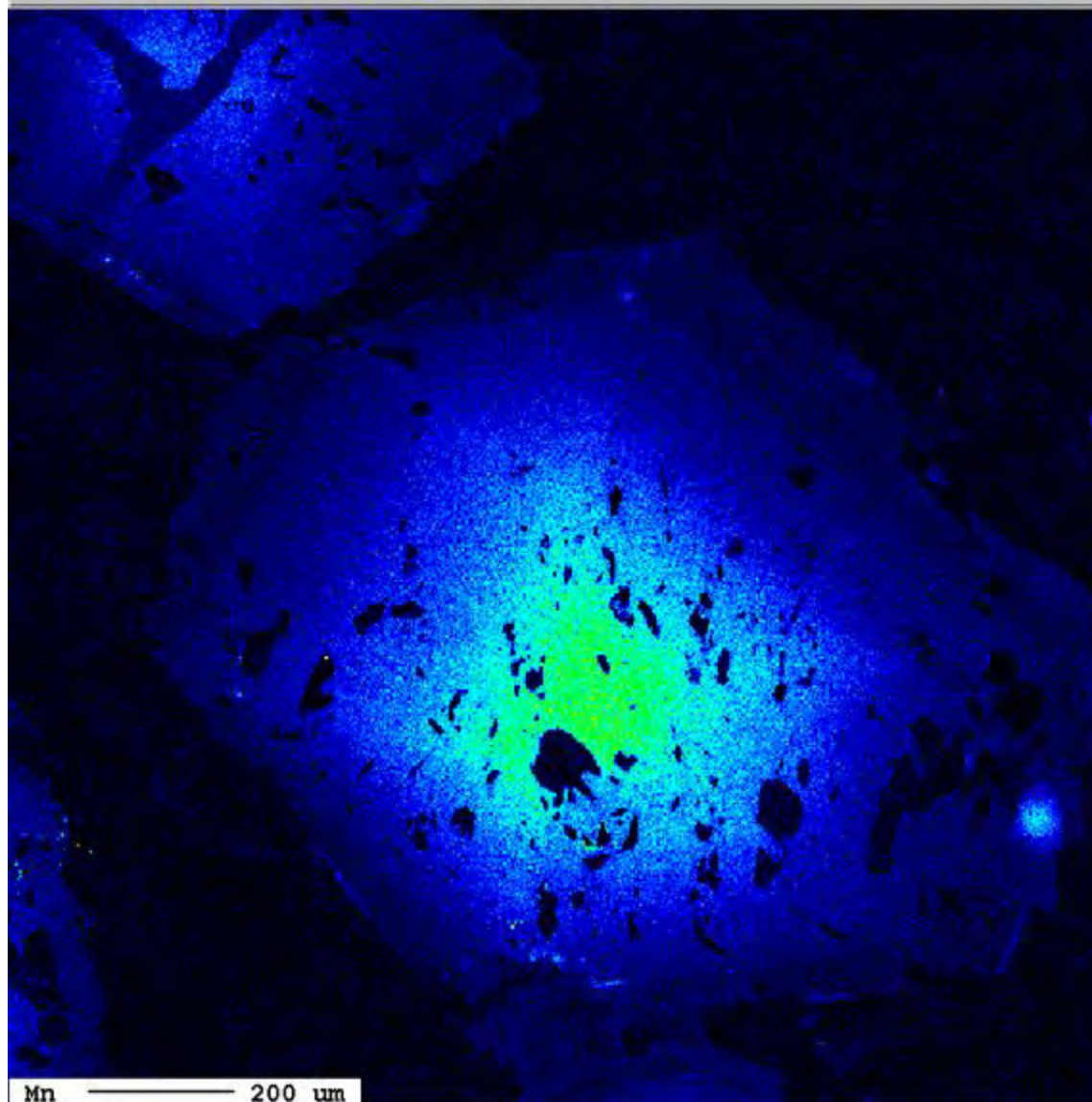




Amphibole-zoisite eclogite mineralogy

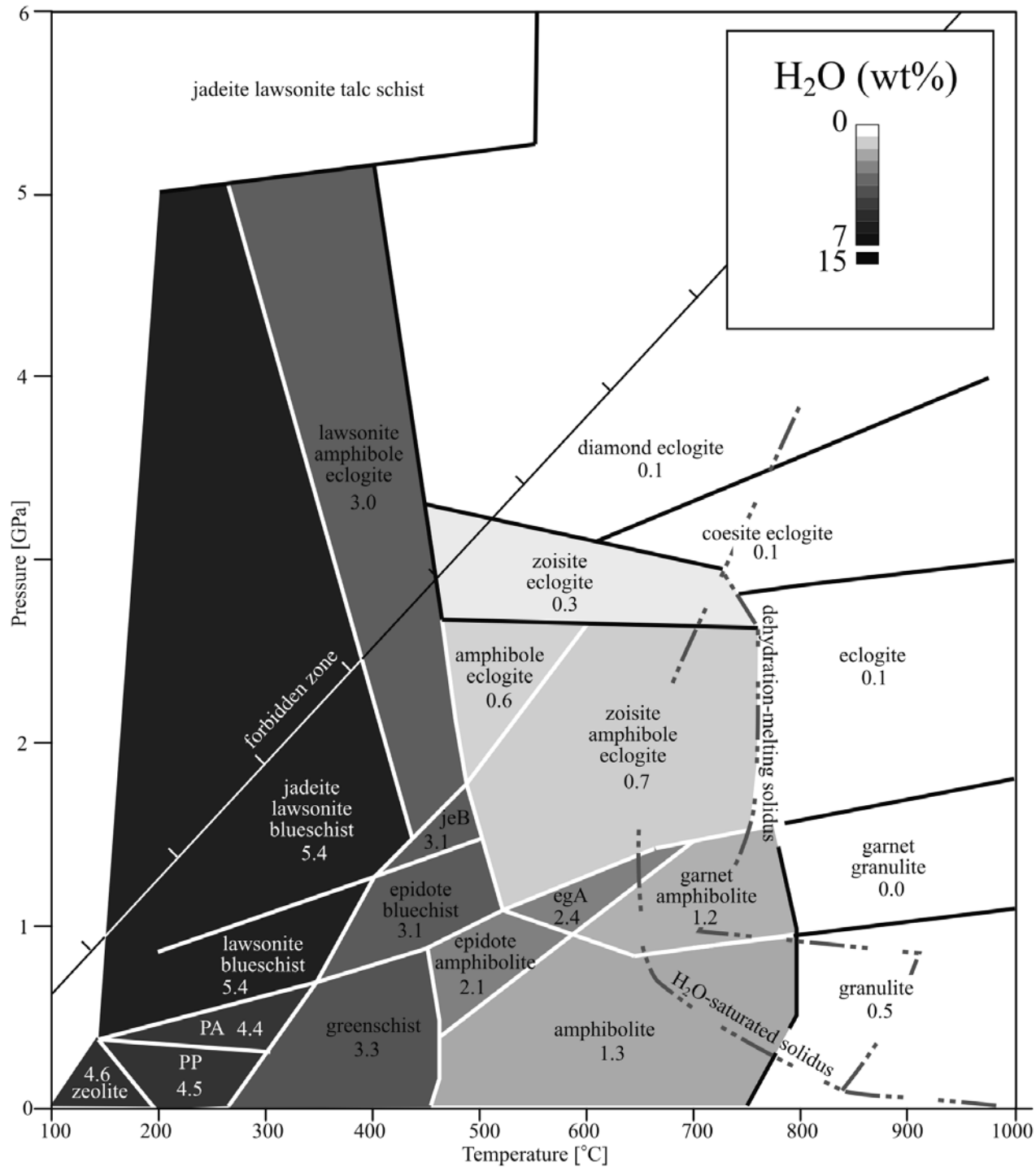
- Fine-grained
- Garnet porphyroblasts
Zoning indicates progressive heating
- Matrix: Omphacite, Glaucophane, Zoisite, Rutile, Titanite (mantling rutile), Phengite, Zircon
- Inclusions in Garnet: Omphacite, Glaucophane, Zoisite, Titanite, Rutile, Paragonite, Zircon, Quartz
- No Lawsonite
- No Kyanite

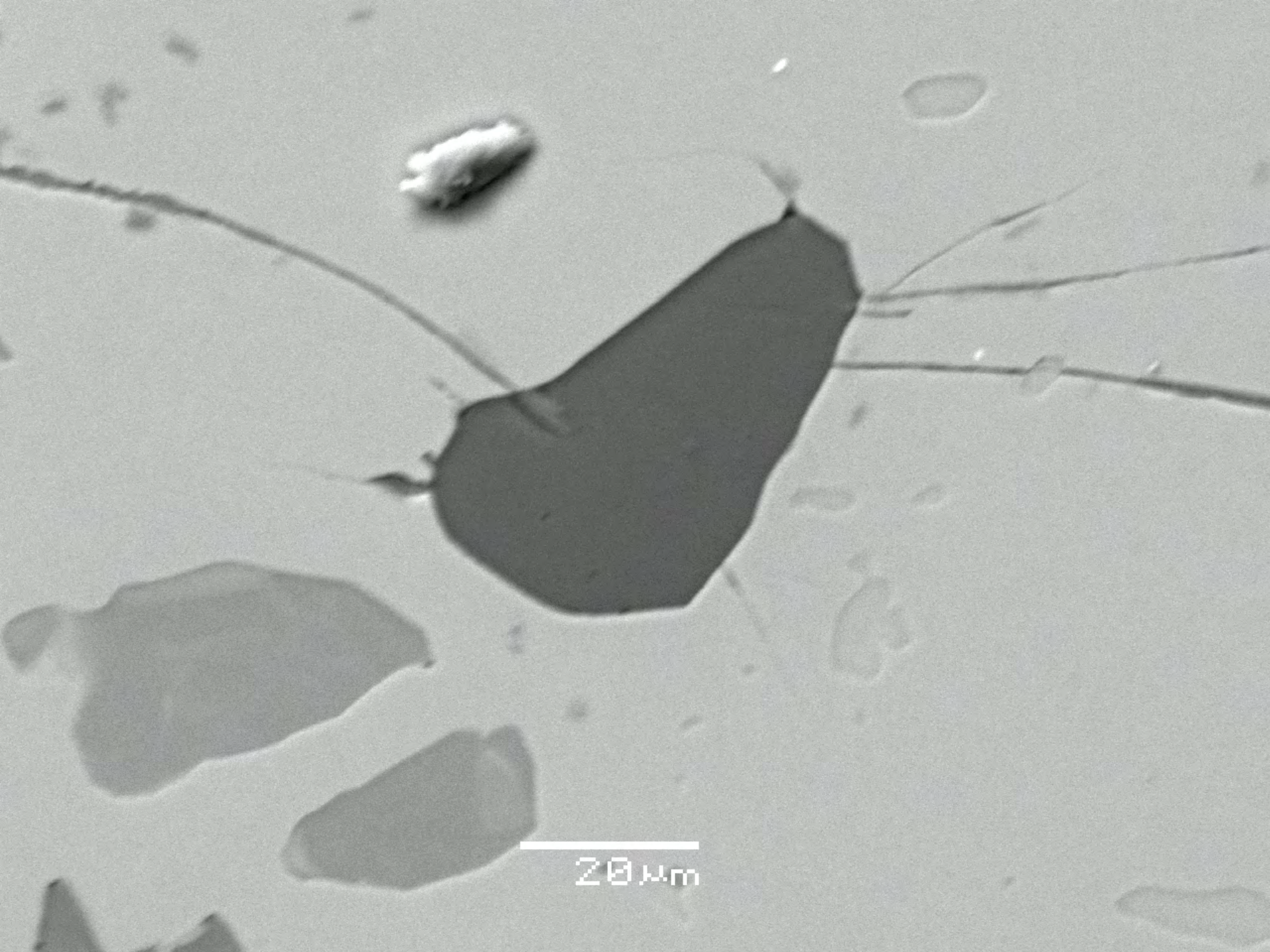
2013_21Feb_23 : Syros1



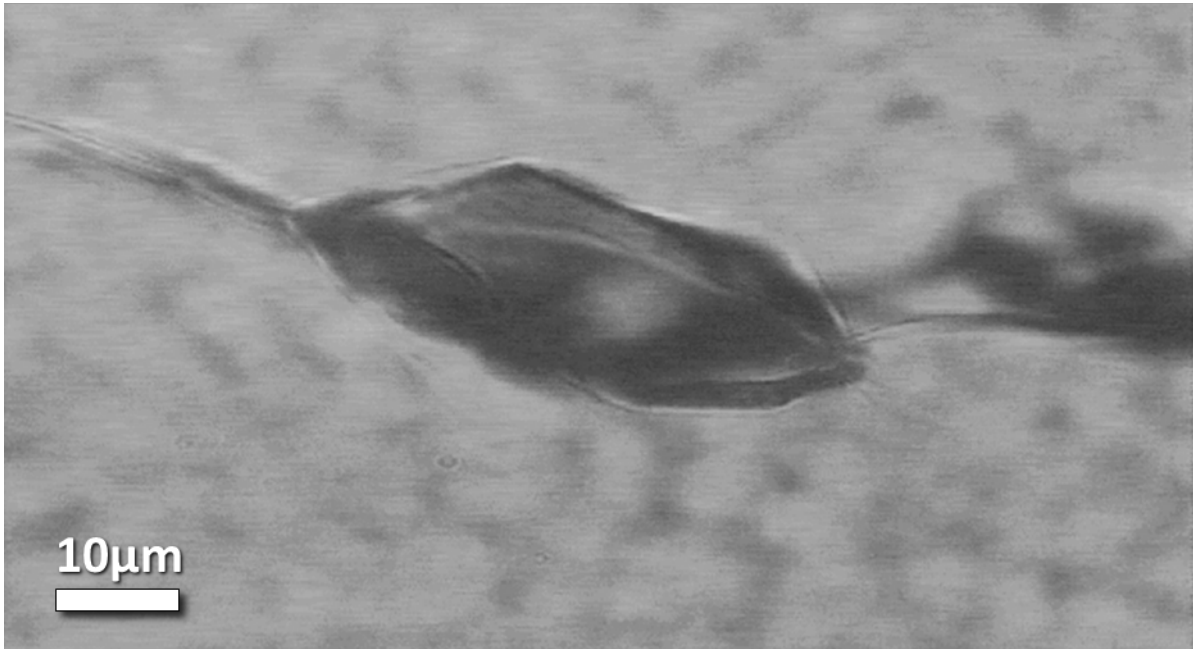
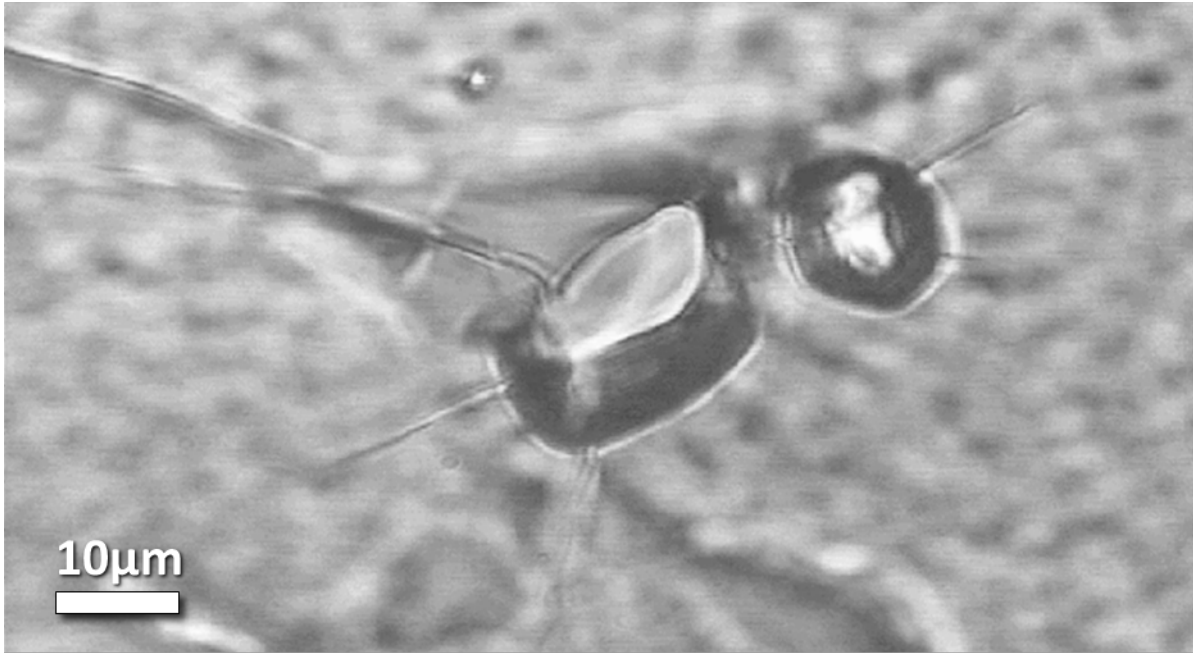
Mn	Lv	%
159		0.0
139		0.0
119		0.0
99		0.0
79		0.0
59		0.7
39		3.9
19		11.0
0		84.3
Ave		10 ^{0.0}

Syros1
Feb 25 03:05 2013

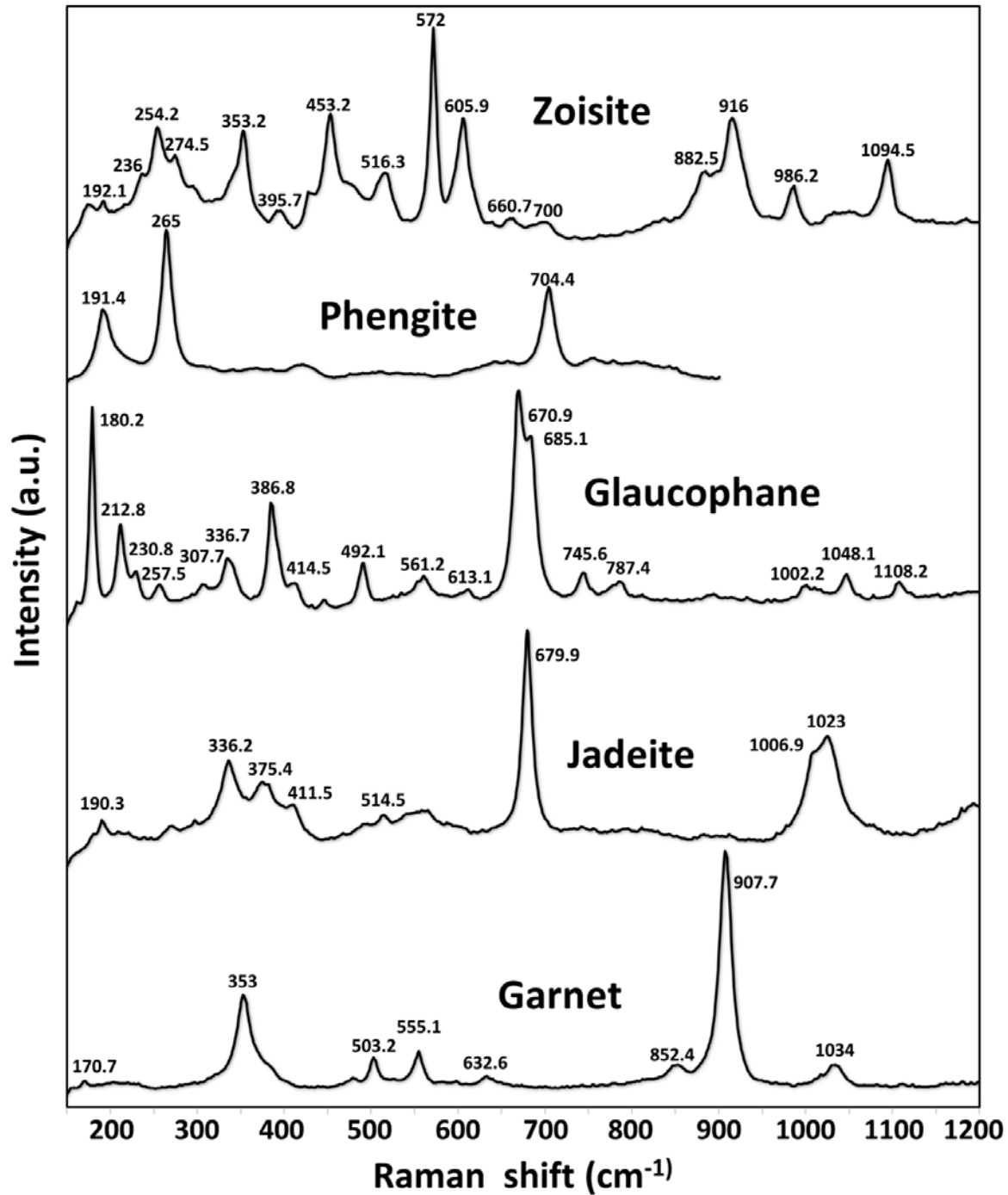


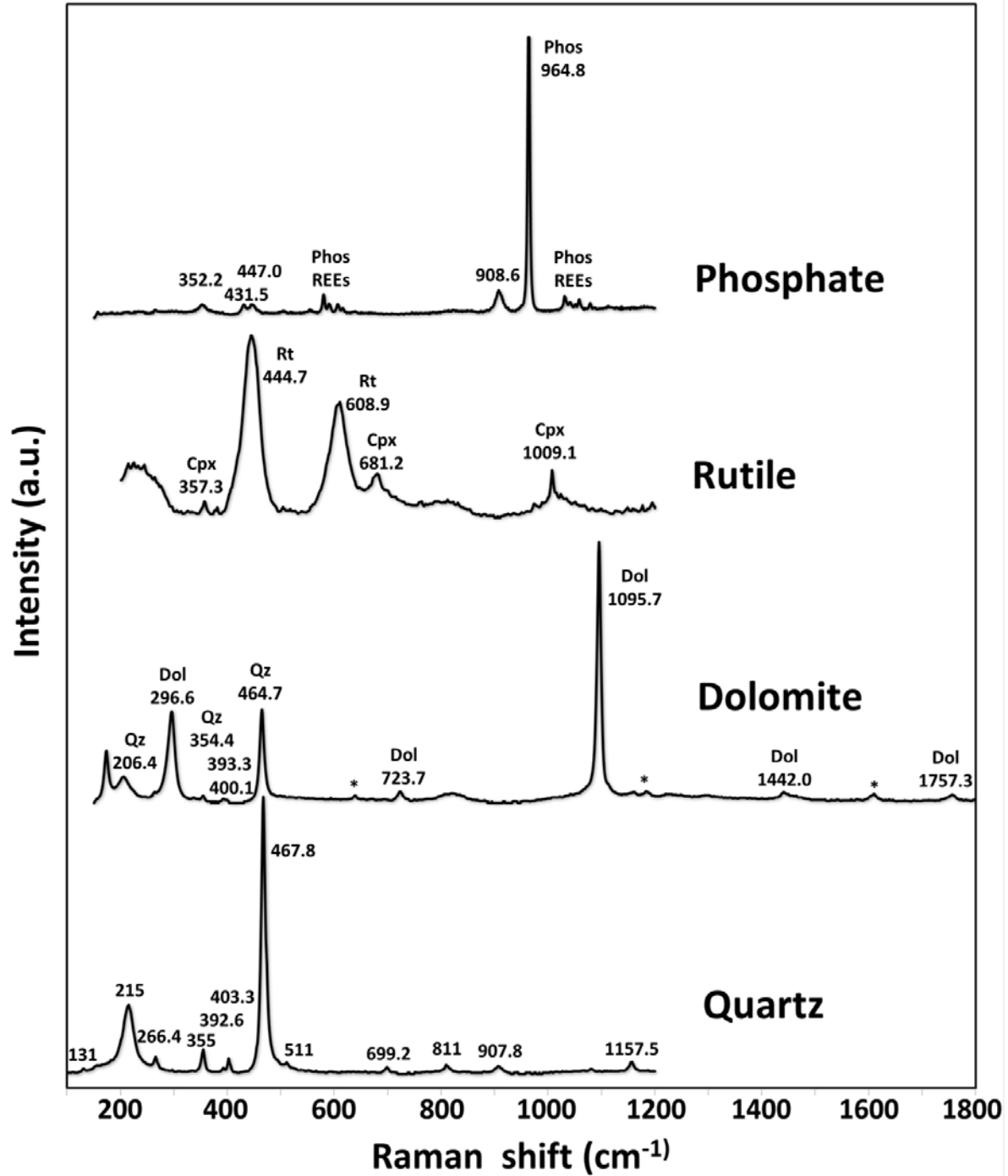


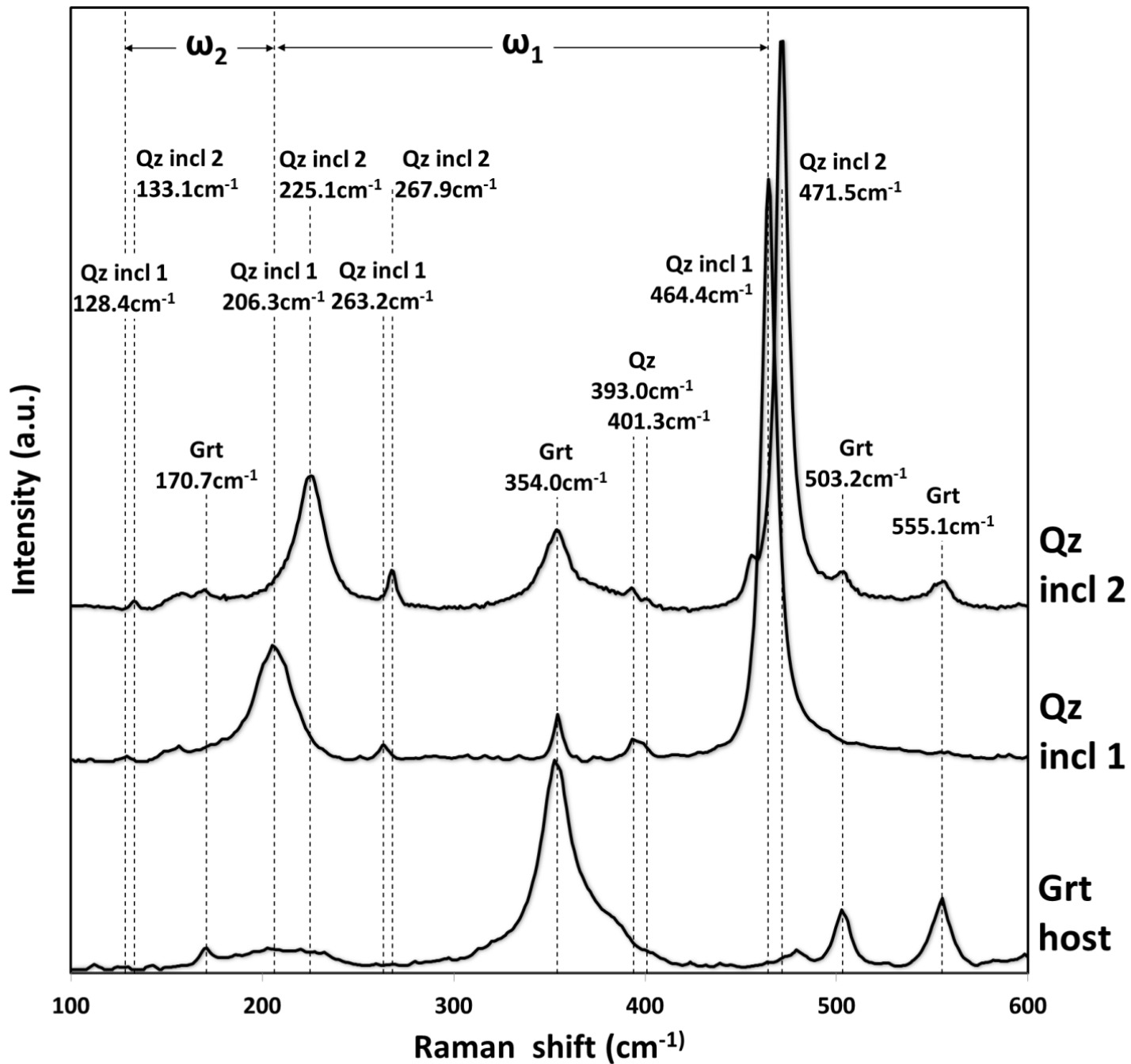
20 μm

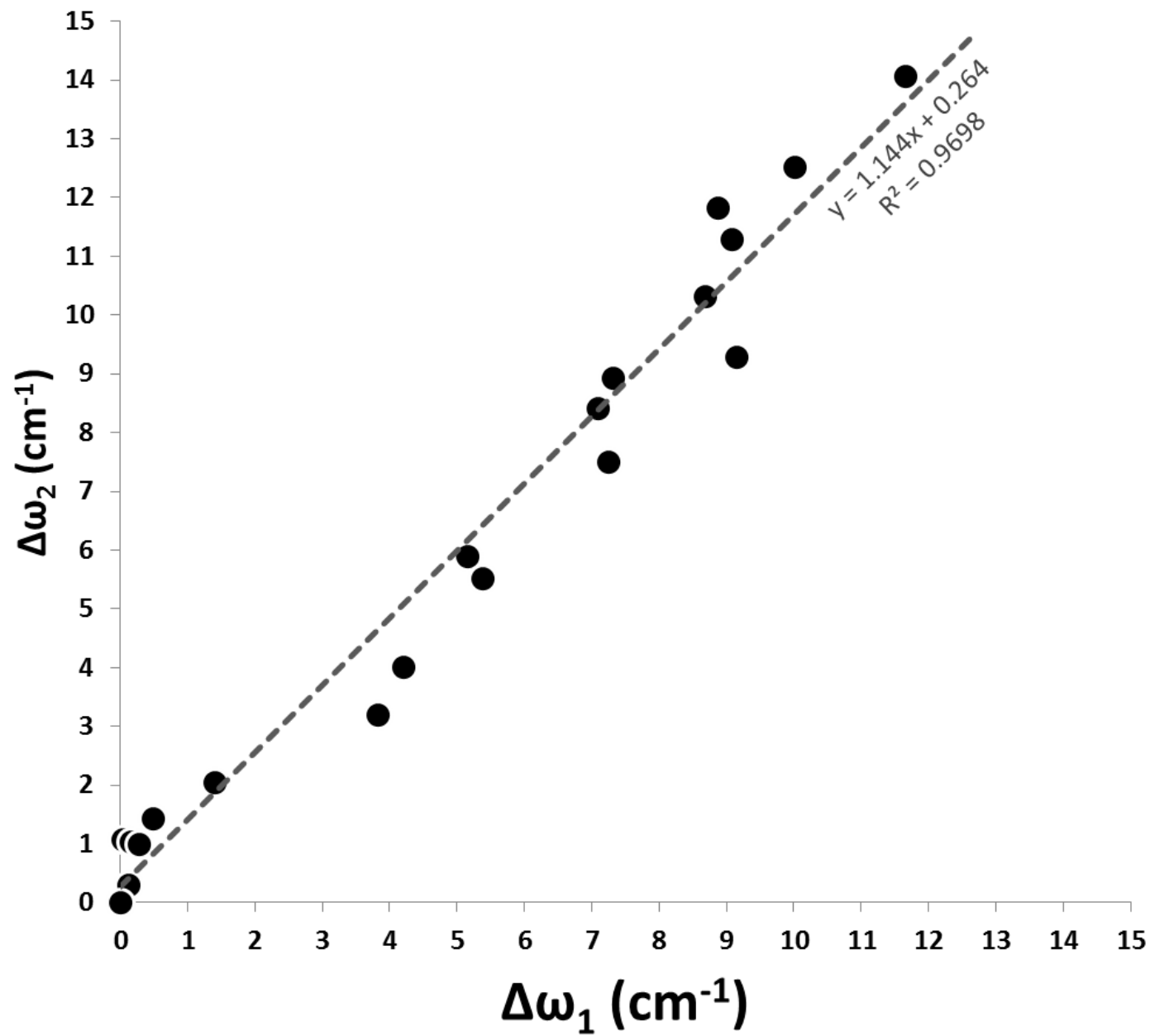


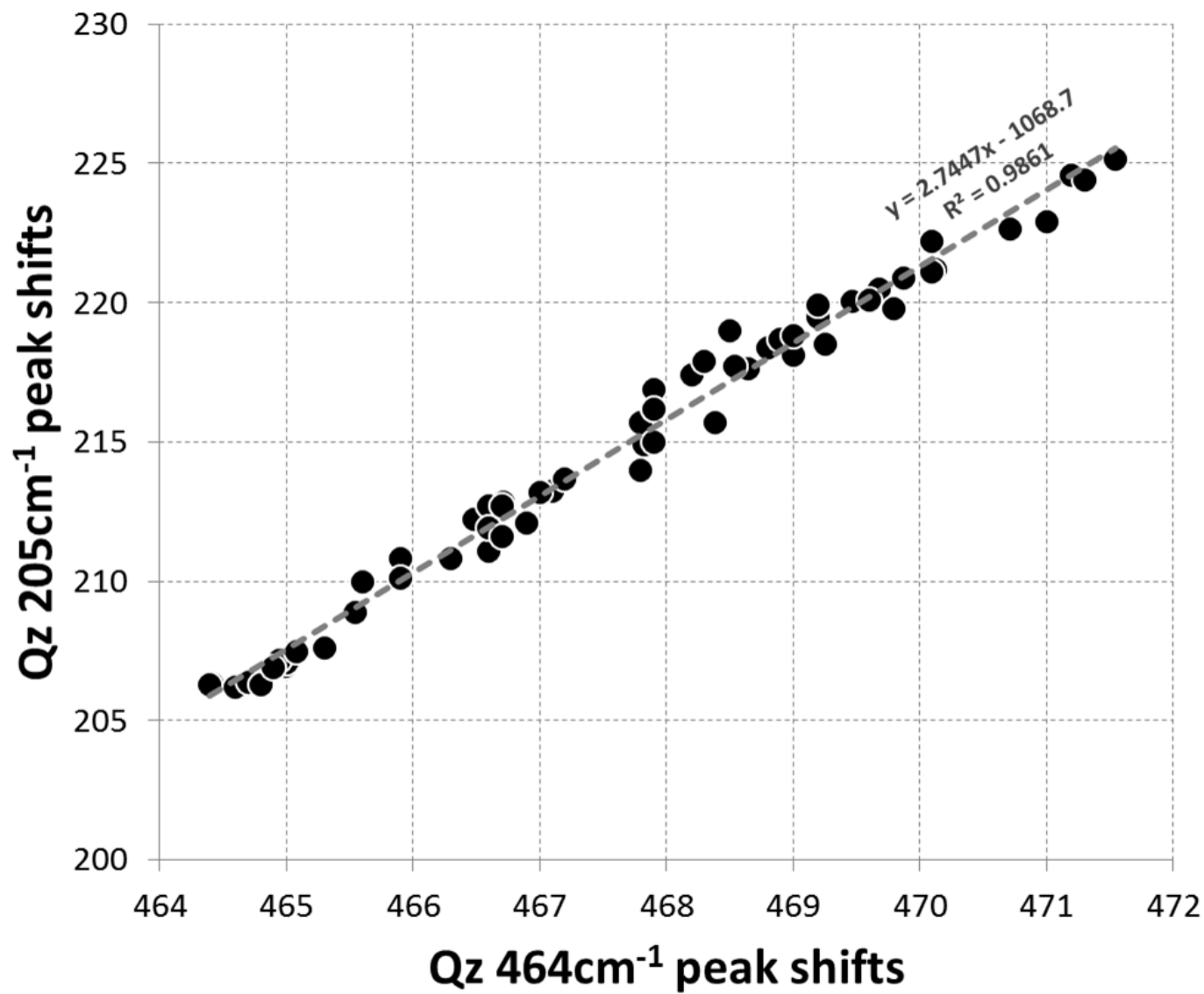
Laser micro-Raman spectroscopy





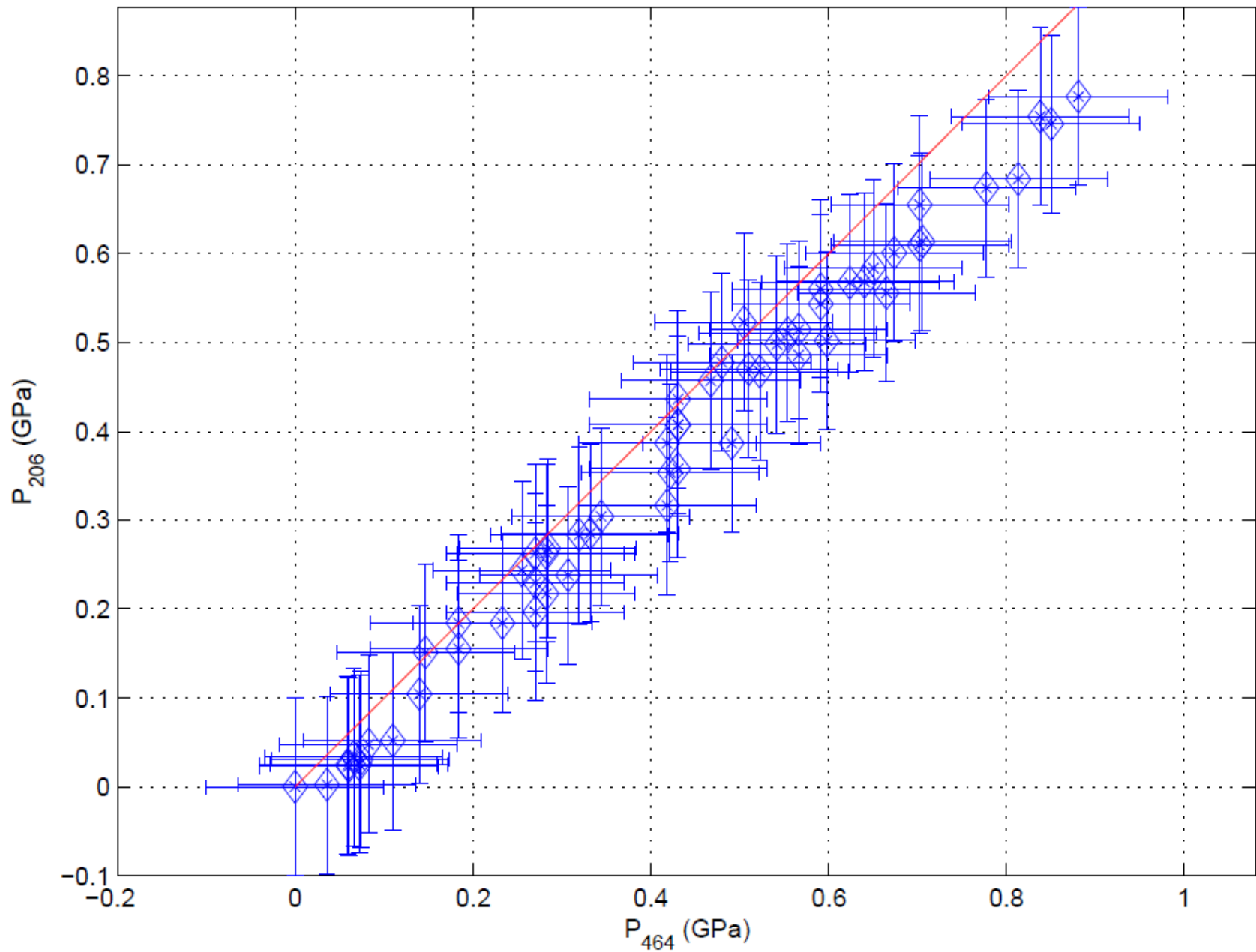




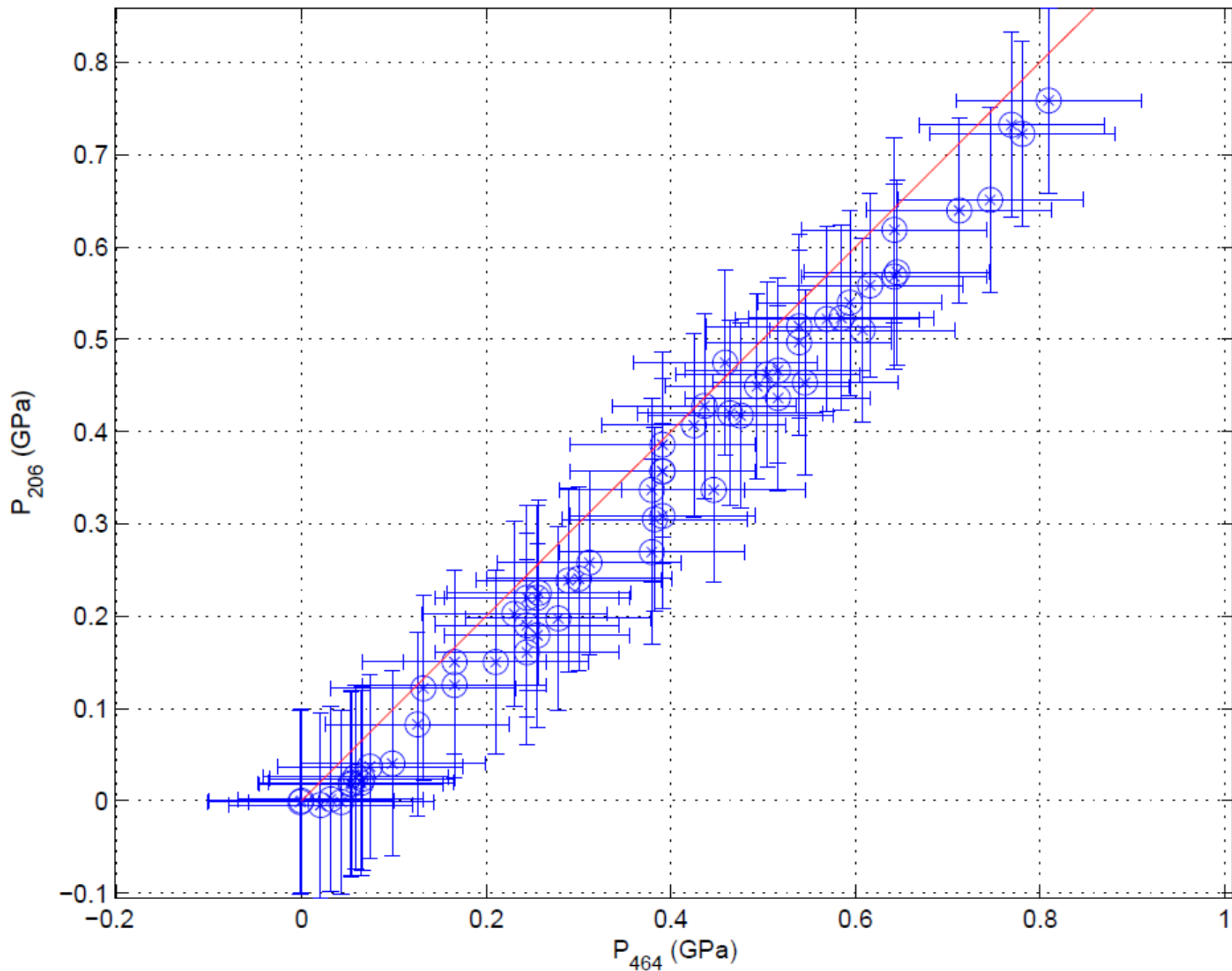


Raman barometry

In situ Raman barometry of Quartz Liu & Mernagh 1992

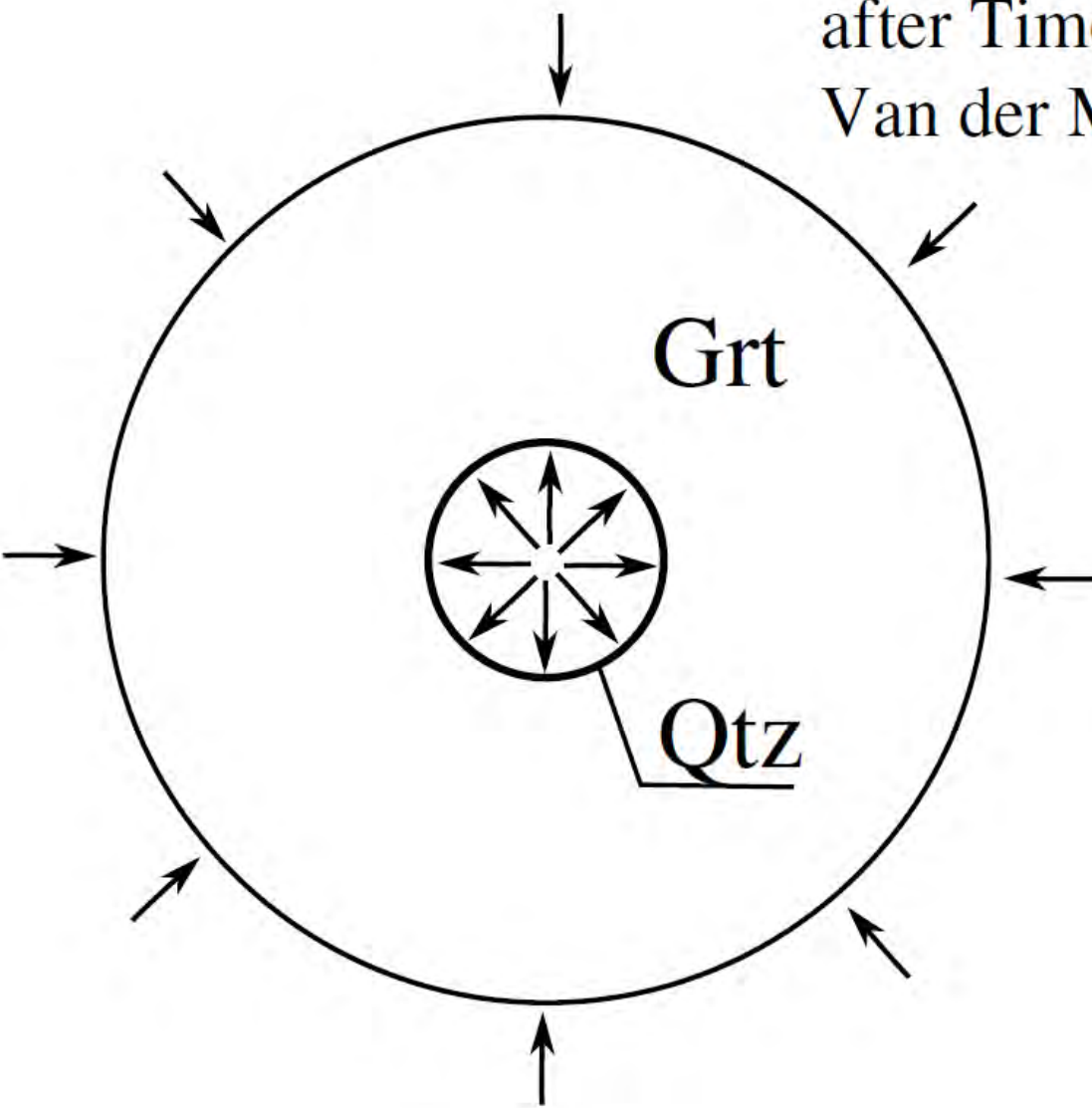


In situ Raman barometry of Quartz Schmidt and Ziemann 2000



Garnet elastic modelling

after Timoshenko & Goodier (1951)
 Van der Molen (1981) etc



$$\Sigma F=0$$

P: pressure

κ : bulk modulus

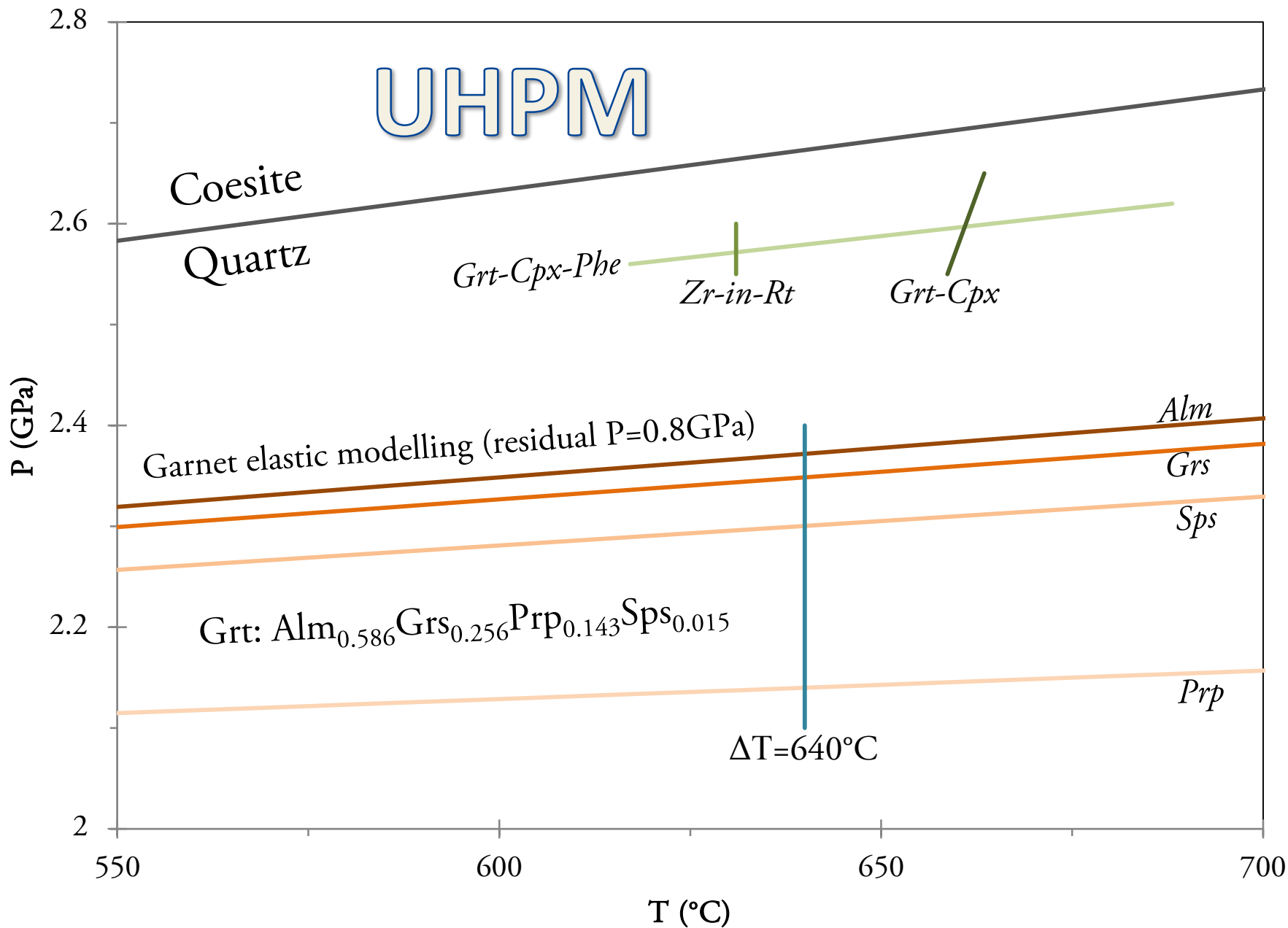
μ : shear modulus

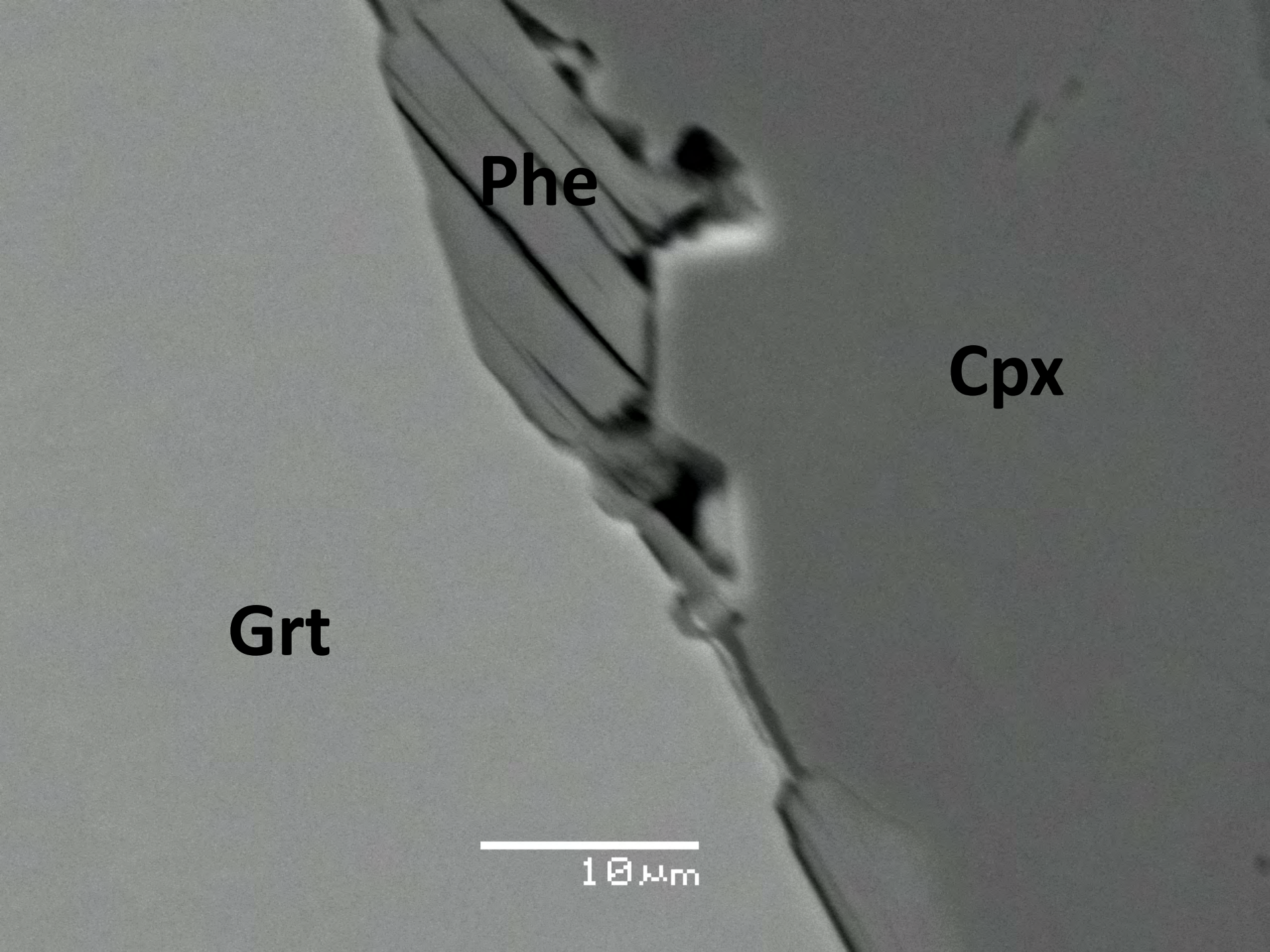
T: Temperature

A: Thermal expansion

$$P_{Qtz} = \frac{\kappa_{Qtz}}{\kappa_{Grt} (3\kappa_{Qtz} + 4\mu_{Grt})} \left\{ P_{Grt} (3\kappa_{Grt} + 4\mu_{Grt}) - 4\kappa_{Grt} \mu_{Grt} \Delta T \Delta A \right\}$$

UHPM





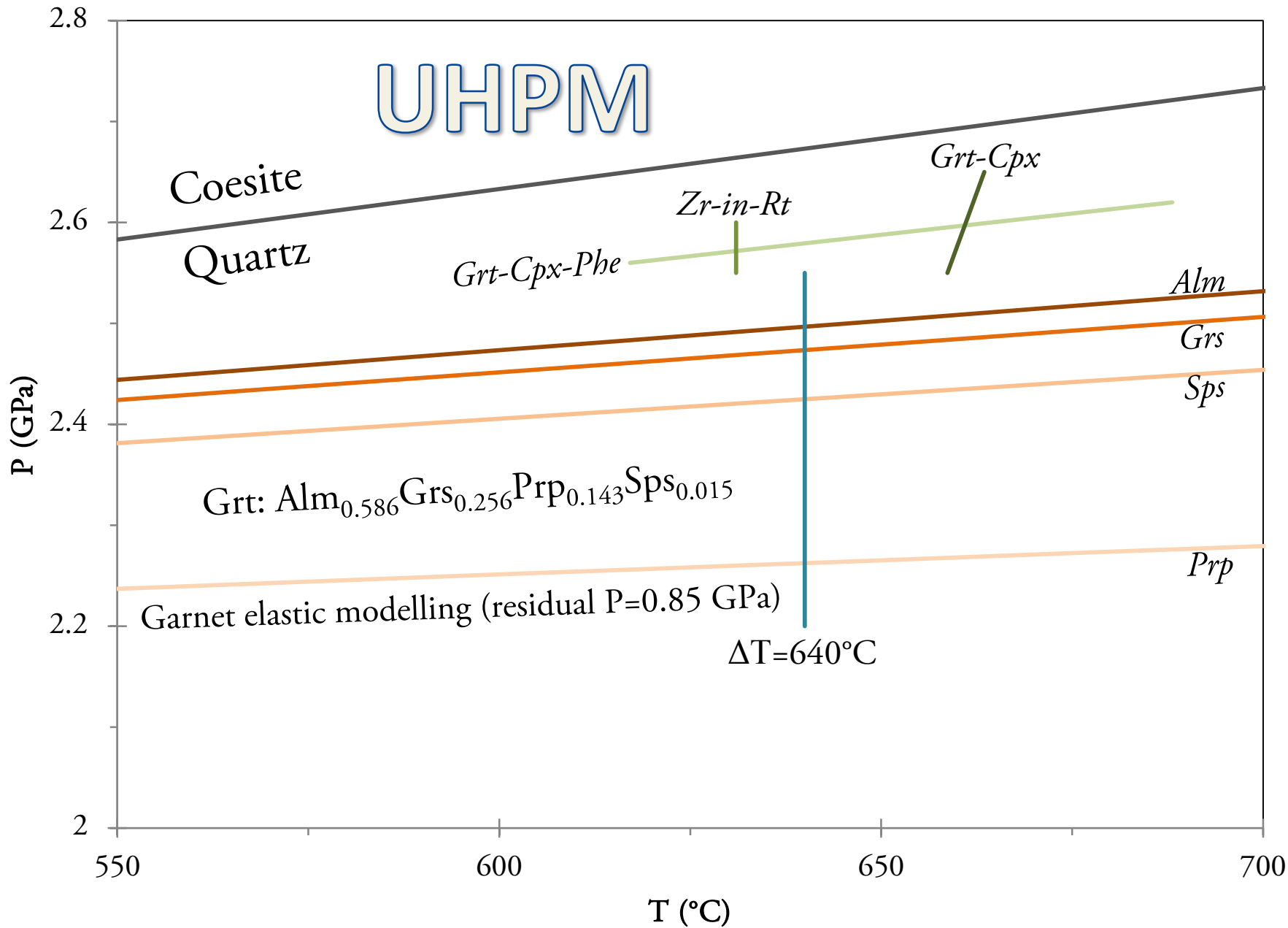
Phe

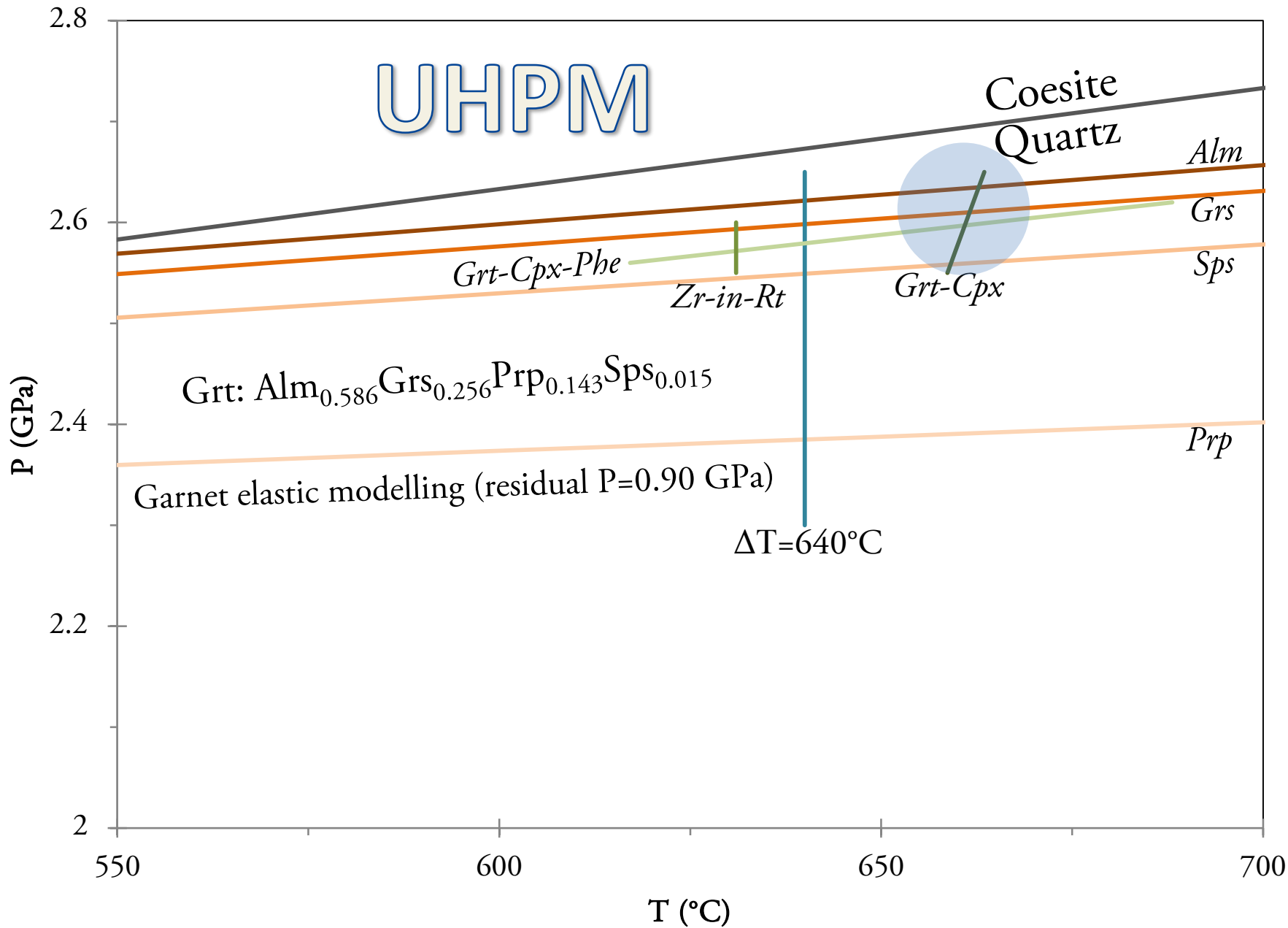
Cpx

Grt

10 μm

UHPM







ALKYON

