Supplement – In situ apatite U-Pb, fission track and (U-Th)/He triple dating using a simple embedding approach

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Figure S1:

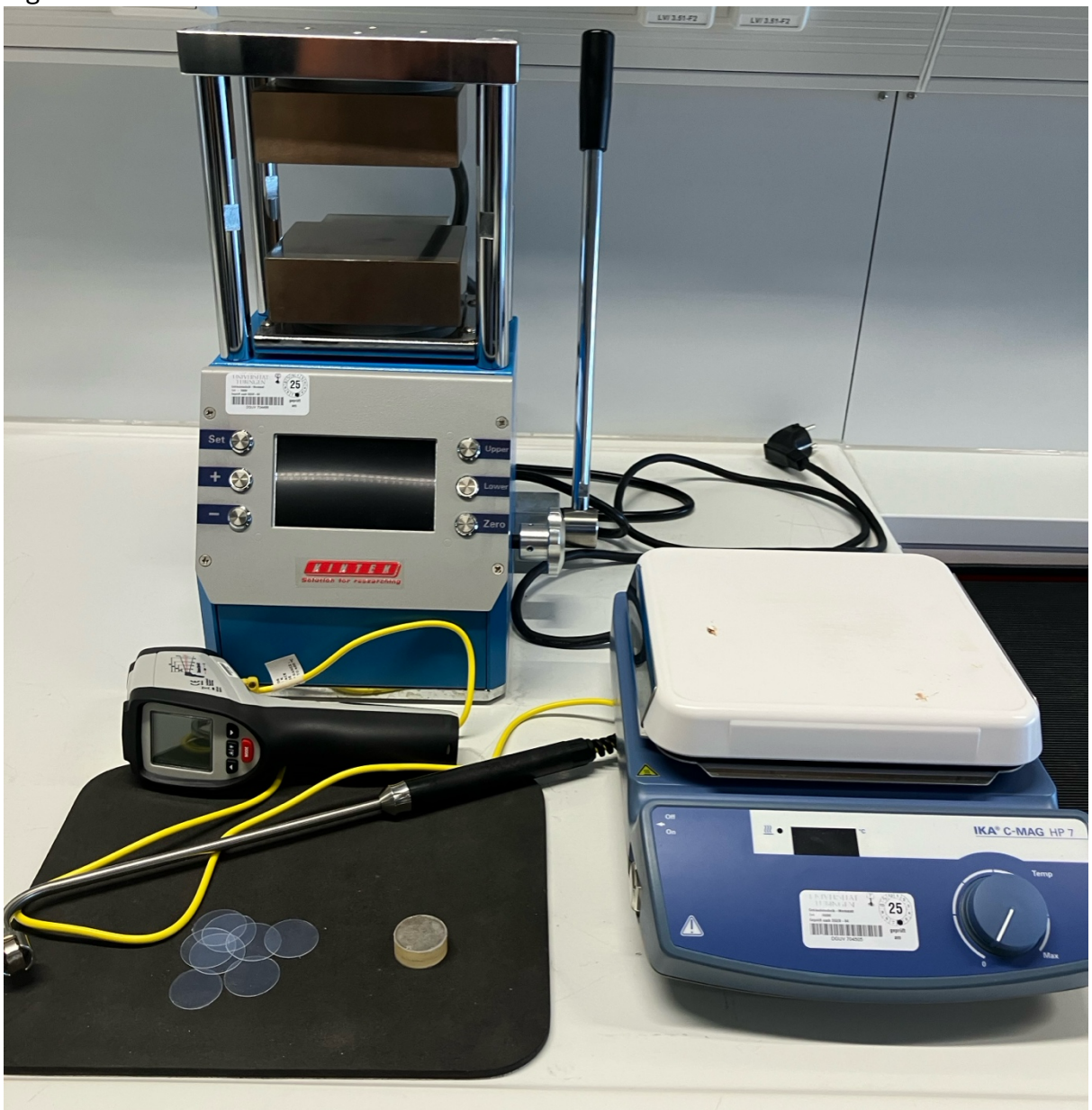

Fig. S1: Picture showing the main components used for the Teflon embedding. The manual heat press in the background and the heat plate to the right. Thermometer with surface probe and round 1'' Teflon films. Next to it, a round 1'' thick epoxy mount with attached Teflon film is visible.

Figure S2:

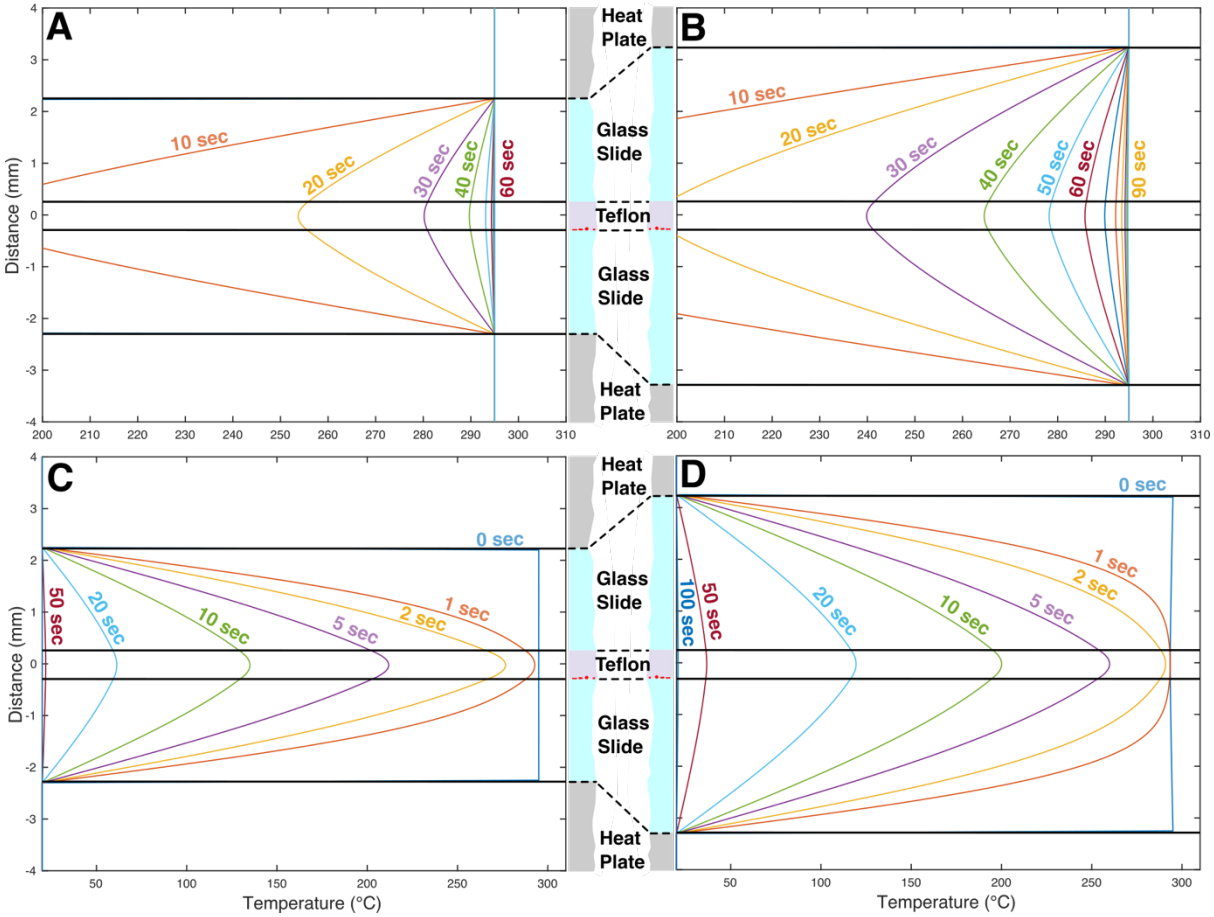

Fig. S2: Temperature evolution with 2 mm and 3 mm glass slides during the mounting process. A/B) Heating phase of the glass–Teflon–glass sandwich on top of the heat plate. C/D) Cooling phase of the glass–Teflon–glass sandwich after removal from the heat plate. Note that our modelling approach to quantify the annealing of fission tracks and diffusion of He in apatite neglects that grains do have a higher thermal diffusivity compared to the surrounding Teflon film and that initially apatite grains reside between the glass slide and Teflon film for some time. We do, however, expect that this is only marginally impacts the resulting thermal evolution.

Figure S3:

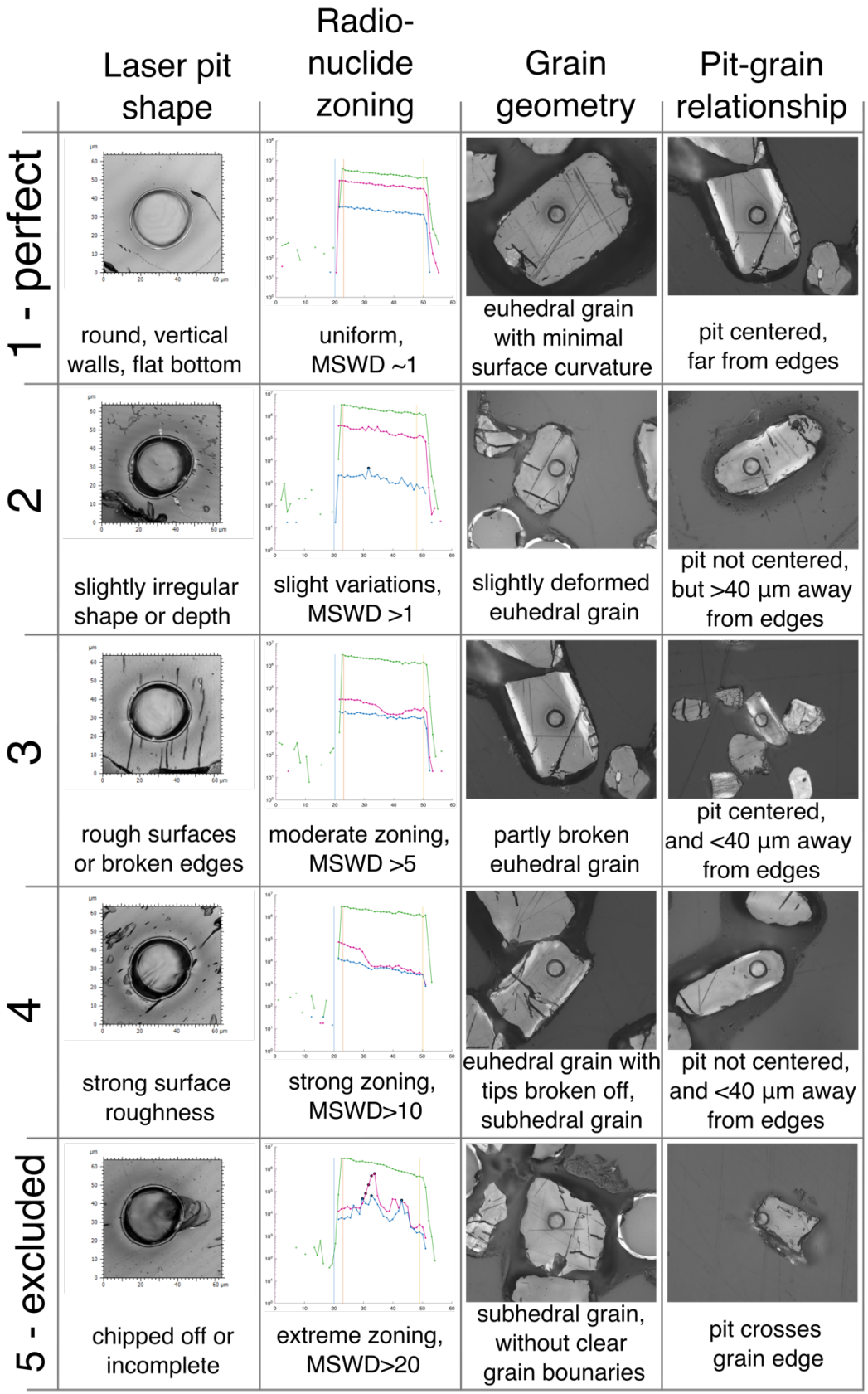

Fig. S3: Decision matrix to rank/exclude in-situ (U-Th)/He measurements. Same as Fig. 5 in the main text, but with real examples. The laser pit images are texture images captured with a confocal laser microscope. The red, green and blue lines in the second

column (Radionuclide zoning) represent counts measured by LA-ICP-MS for Ca (green), U (blue) and Th (red). The image examples for the grain geometry and pit-grain relationship are reflected light images taken with a 20x objective, while in all images the laser pit has a diameter of 30 µm.