
FOUNDATIONS
ADVANCES

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**Supporting information for article:**

# A side-by-side comparison of the solidification dynamics of quasicrystalline and approximant phases in the Al-Co-Ni system

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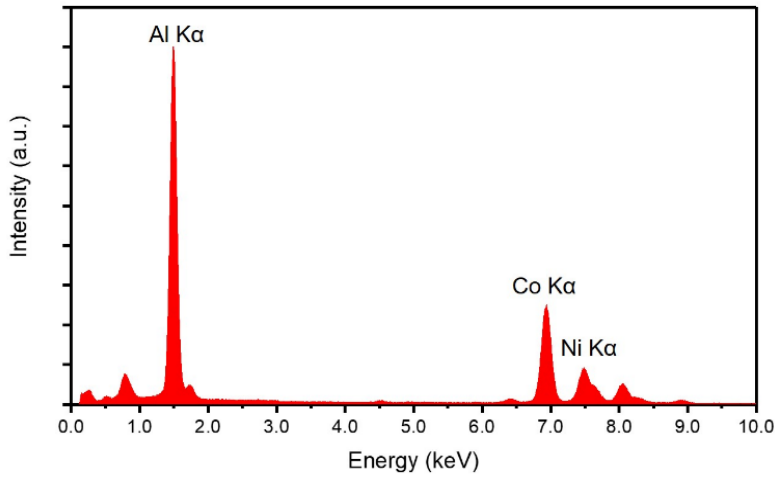


**Figure S1** Energy dispersive spectroscopy (EDS) data collected on the as-synthesized $X$ phase. The average atomic percent of Al, Co and Ni ratio from multiple TEM EDS measurements was $67.4 \pm 1.7$ at%, $24.0 \pm 1.1$ at% and $8.7 \pm 0.8$ at%, respectively. The average EDS values correspond well with the known $X$ phase composition, $Al_9(Co,Ni)_4$. The small peak at 8.05 keV corresponds to the Cu TEM grid.

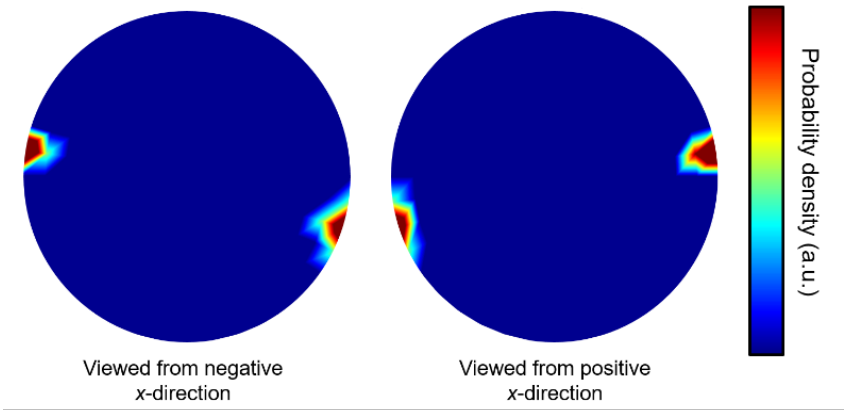


**Figure S2** Stereographic projections of the long axes of the $X$ phase crystals. Shown are two opposing viewpoints in the specimen frame, the negative $x$-direction (left) and the positive $x$-direction (right). The sharp peaks in both probability distributions indicate the strog degree of alignment of the crystals.

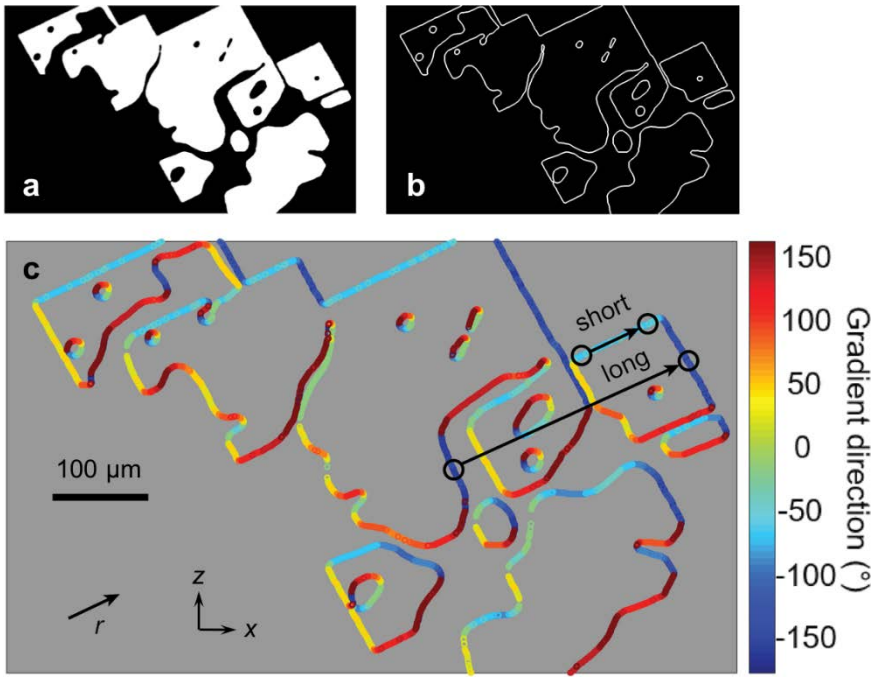


**Figure S3** Processing steps for correlation analysis. (a) Segmented image taken along the specimen $x$-$z$ plane, which is nearly perpendicular to the crystallographic {010} plane of all growing $X$ phase crystals (see also **Fig. S2**). (b) Mask image that only includes the solid-liquid interfaces of (a). (c) The orientation of each pixel belonging to the interface in (b), encoded as the direction of the image gradient (measured counter-clockwise from the positive $x$-axis, see colorbar). Note that opposite sides of a given crystal have orientations that differ by 180°. The arrows indicate both short-range (denoted "short") and long-range ("long") autocorrelations $g(u, u'|\vec{r})$ of facet orientations $u$ along the prescribed vector $\vec{r}$. The temperature (time) corresponds to 1213.5 K (3580 s).