MS21-2-3 An incommensurately modulated composite structure in the Nd-Ru system
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Abstract
Despite the interesting magnetic and superconducting properties of the phases in the binary systems RE-Ru (RE = La, Pr, Nd), the compounds at about 35-38 at.% Ru have remained uncharacterized due to their complex crystal structure [1,2]. High-resolution diffraction experiments (beamline Cristal, synchrotron Soleil, France) on single crystals of the Nd compound revealed a composite structure comprising observable satellites up to very high order (Fig. 1). The partial overlap required manual indexing and processing of the satellite reflections which will be explained in detail in this contribution.The resulting 3D+1 structure was solved in space group *X*4/*nbm*(00*g*)00*ss* with *a* = 15.6130(8) Å, *c* = 6.3258(4) Å, *q* ≈ 2/23. In [001] direction, Nd atoms form chimneys, hosting linear Ru-Ru chains (Fig. 2). This structural arrangement is closely related to that of $Y_{44}Ru_{25}$ [3] and in turn to that of Nd_5Ir_3 (Pu_5Rh_3-type, [4]).

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References
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Fig.1. Diffraction pattern of the (h0l) layer.

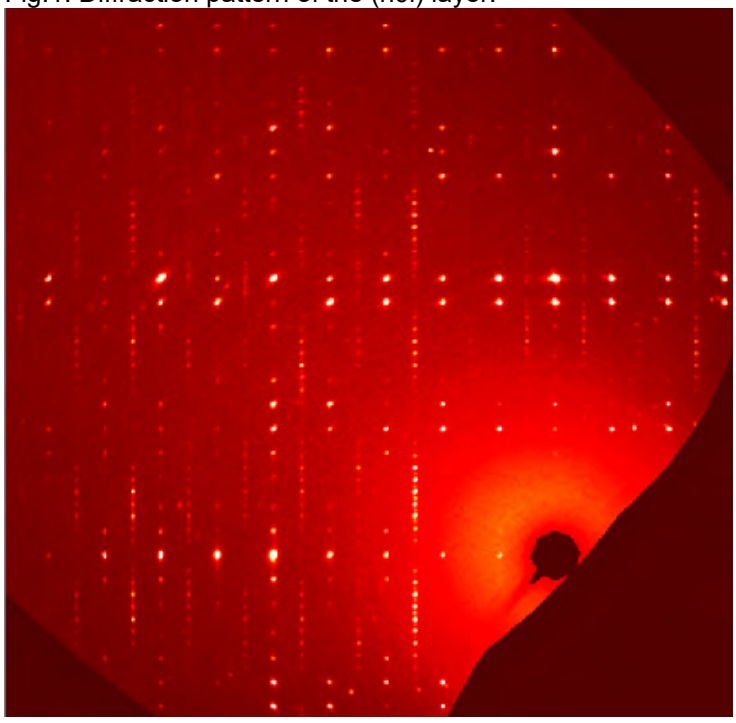

Fig. 2. Nd-chimneys with linear Ru-chains.