Towards a structural framework for apatite-iron oxide deposits in the Grängesberg-Blötberget area, Bergslagen, Sweden

S. Eklöf[1]*, K. Högdahl[1], E. Jonsson[1,2], A. Malehmir[1], and M. Setter[3]

[1]*Department of Earth Sciences, Uppsala University, SWEDEN (*correspondence: sara.eklof@geo.uu.se)*
[2]*Geological Survey of Sweden (SGU), Uppsala, SWEDEN*

[3]*Nordic Iron Ore (NIO), Ludvika, SWEDEN*

The REE-bearing Kiruna-type apatite-iron oxide (AIO) deposits at Grängesberg and Blötberget represent the largest iron ore concentration in southern and central Sweden. Both regarding immediate host rocks and actual mineralisation type, this group of deposits stand out as a marked anomaly in the Bergslagen ore province. The AIO deposits are situated in the western part of this intensely mineralised Palaeoproterozoic province along a 40 km long NNE trending winding line. This stretches from Grängesberg in the south, via Blötberget to Idkerberget in the north and further east to the small Kopslahyttan deposits. The Grängesberg deposit consists of moderately to steeply dipping magnetite-dominated lenses, which coincide with an inferred F_1 fold limb, suggesting a synmetamorphic structural control on the ore. Around the lenses, prolate strain is focused at the lens crests and oblate strain at the tapering edges, as a result of competence contrast between competent bodies, including the ore, and the phyllosilicate altered host-rocks during D_2 shortening (Persson Nilsson et al. 2013). Preliminary results from the Blötberget area suggest a similar location of prolate and oblate strain around competent lenses. Two ductile planar fabrics have been observed both in the host-rock and in the ore. Platy hematite ore is in places crenulated, with a small angle to S_2, implying that this hematite type was formed prior to D_1. A similar fabric has been encountered in the phyllosilicate altered rocks in Grängesberg. To better understand the structures hosting the Bergslagen AIO deposits, provide information about their extent at depth, and their evolution and relations to other iron oxide mineralisation types, a detailed structural study is currently being carried out within the framework of the 'StartGeoDelineation' project (ERA-MIN) supported by Vinnova, SGU, NIO, Tekes and Yara.

References:

Persson Nilsson, K. et al. 2013. The Grängesberg apatite-iron oxide deposit. Research report. SGU. 45 pp.