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## Determining the alignment of thin MoS<sub>2</sub> layers from Raman and GIWAXS measurements

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Thin MoS<sub>2</sub> layers grown by sulfurisation of Mo films can be aligned horizontally or vertically depending on the initial Mo thickness. So far, the vertical alignment of MoS<sub>2</sub> layers has been detected by TEM measurements. However, TEM provides information only from a very limited area of the sample and requires time consuming and laborious sample preparation. Alternatively, grazing incidence wide-angle X-ray scattering (GIWAXS) can be used for detecting the layer alignment in MoS<sub>2</sub> thin films. Still, this technique is not widely used. We present here that Raman spectroscopy (in combination with GIWAXS measurements) can provide information equivalent to that from GIWAXS or TEM on the layer alignment. Raman spectroscopy is a fast method, easy to use and needs no special sample preparation. We present measurements of the intensity of A<sub>1g</sub> and E<sub>2g</sub> lines as a function of the angle between the polarisation of the incident and scattered light in backscattering geometry. From the measurements, a depolarisation ratio for both Raman modes was obtained, showing its distinctive values for the two layer alignments indeed. We demonstrate the method by specifying the alignment of MoS<sub>2</sub> grown on a sapphire substrate partially coated by reduced graphene oxide flakes.

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