Achieves the world's highest level resolution with newly developed atomic resolution analytical electron microscope "GRAND ARM™2"

Product used : JEM-ARM300F2

The remarkable features of the new atomic resolution analytical electron microscope (GRAND ARM™2) is "stability", which has been realized by developments of microscope column enclosure, lightweight electron gun, stability-improved lens current supplies and so on. The supreme stability provides the highest resolution. Another important feature is "high analytical sensitivity while atomic resolution", which has been realized by new shape optimized objective lens "FHP2". The combination of this new lens and JEOL developed ETA aberration collector provides wider flat phase region in STEM Ronchigram than one of the previous machine. Thus, the new atomic resolution analytical electron microscope has performs highest level resolution with improved stability and high analytical sensitivity.

Achieves STEM-ADF resolution of 40.5 pm

Figures 1 (a) and (c) show STEM-HAADF images of a GaN crystal projected along the [212] direction. (a) was acquired in single frame scan, and (c) acquired by 20 frames integration. (b) and (d) are the FFT patterns for those STEM-HAADF images. In Fig. 1(a), which was acquired in single frame, the dumbbell, which shows Ga-Ga interatomic distance of 40.5 pm is resolved. Also, in its FFT pattern (Fig. 1(b)) show the spot corresponding to 39.3 pm, as well as, one corresponding to 40.5 pm. In the STEM-HAADF image obtained by 20 frames integration in Fig. 1(c), shows the Ga-Ga dumbbell distance more clearly. And its FFT pattern, shown in Fig. 2(d), shows the spot at 36.1 pm, which is further far from one obtained in Fig. 1(b). These results show that this microscope provides exactly the highest resolution.

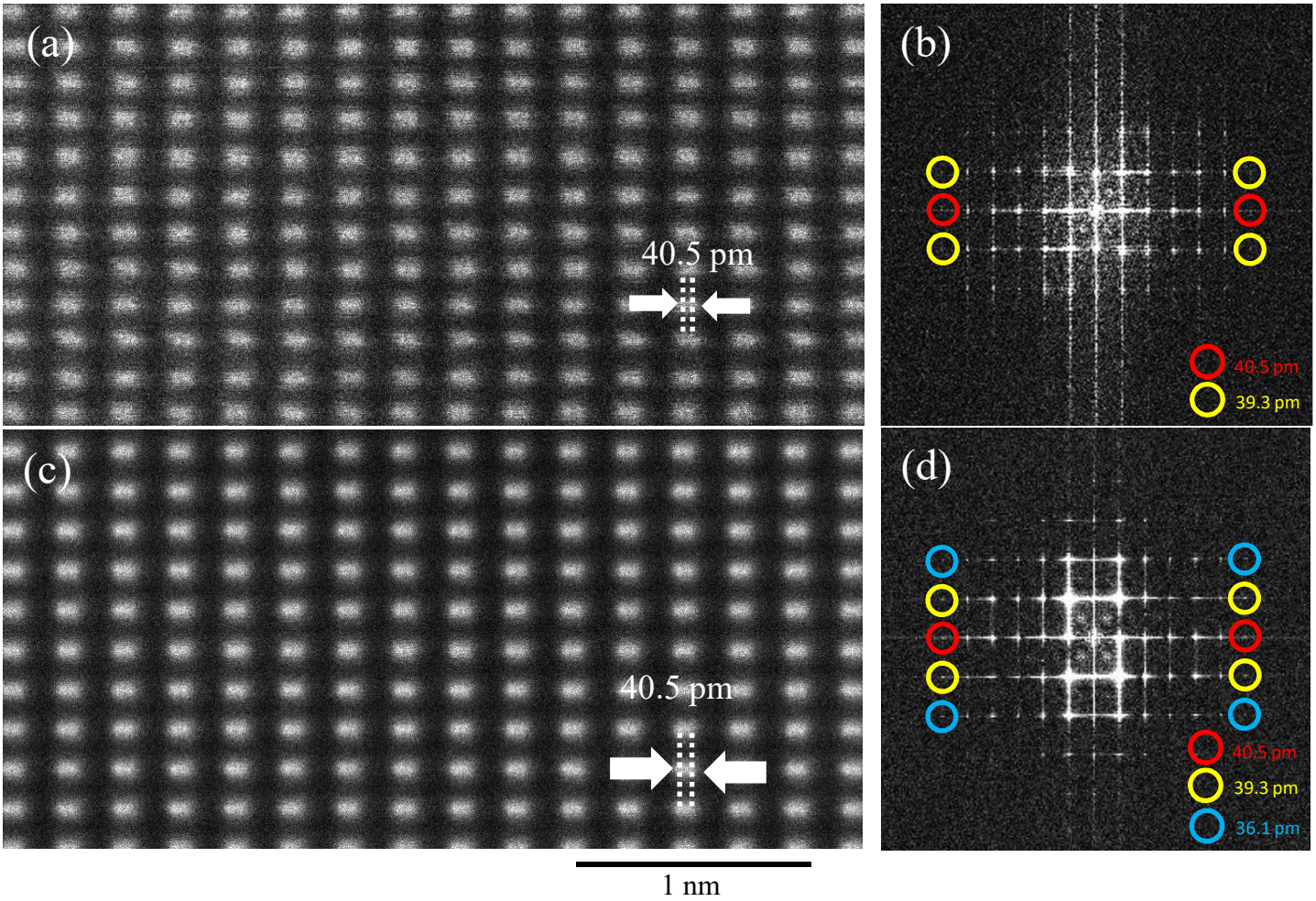

Fig. 1. (a) STEM-HAADF image of GaN [212] obtained by single frame acquisition. (b) FFT pattern of the image shown in (a). (c) STEM-HAADF image obtained by 20 frame integration. (d) FFT pattern of the image shown in (c).

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