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Influence of threading dislocation scattering on the electron mobility in AlGaN/GaN heterostuctures grown by PAMBE MING-HONG GAU, YAN-LIANG CHEN, CHIA-HO HSIEH, HSU-YU CHI, PANG-WEN YUEN, IAKI LO, WAN-TSANG WANG, JIH-CHEN CHIANG, DEPT. OF PHYS., NATL. SUN YAT-SEN UNIV., TAIWAN TEAM — In order to understand the influence of threading dislocation on the transport properties in two dimensional electron gas (2DEG) system, series of modulation doped $Al_{0.25}Ga_{0.75}N$ were grown on GaN with different threading dislocation density by plasma-assisted molecular beam epitaxy (PAMBE). We have observed the distinct characterization in F.W.H.M of (102) rocking curve in GaN [1], which is proportional to total threading dislocation density, when the AlN buffer layer and the following GaN epilayer were grown under III-stable or V-stable condition.The dependence of mobility on carrier concentration was found to follow a bell-shaped curve, and the peak of curve was shifted from $1x10^{13}$ cm^{-2} to $5x10^{12}$ cm^{-2} as F.W.H.M of (102) rocking curve reduced from 1200 sec to 800 sec. We believed that the shift was resulted from the interaction between free electron and charged dislocation when dislocation scattering dominates the transport characteristic. 1. M.H. Gau *et al.* March Meeting of APS (2005)

Ming-Hong Gau
Natl. Sun Yat-sen Univ.

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