

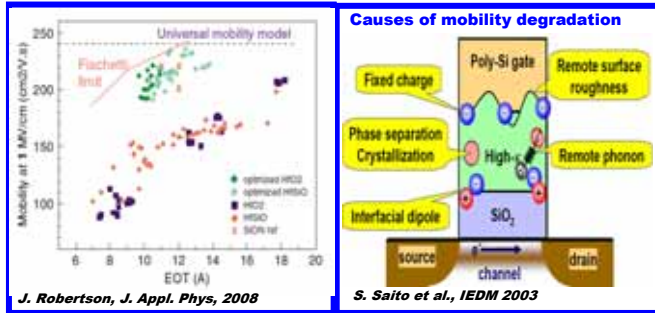
# Remote-surface-roughness scattering-limited electron mobility in ultrathin high-k gate stacked MOSFETs

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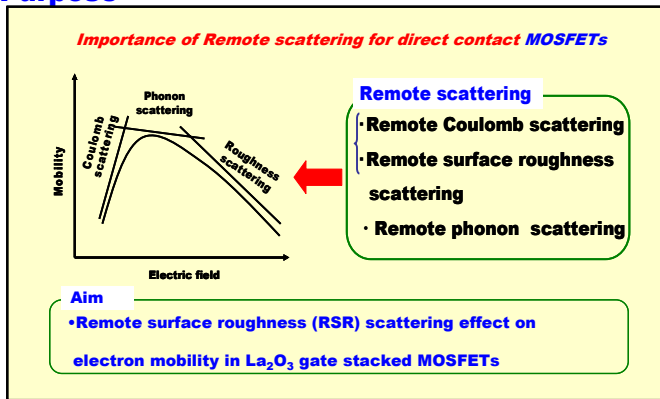
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## Back ground

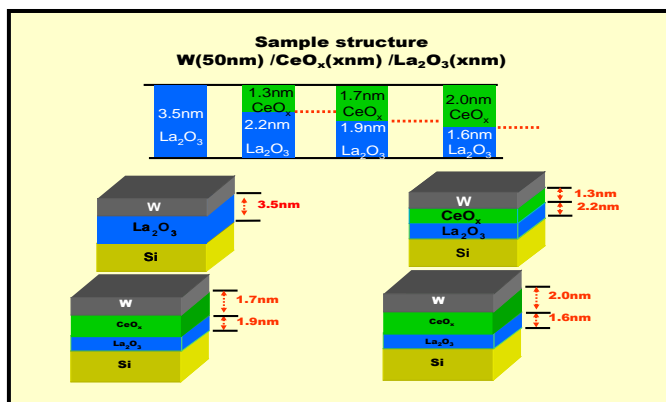
Mobility degradation is one of the main concerns in ultra-thin high-k gate stacked MOSFETs.



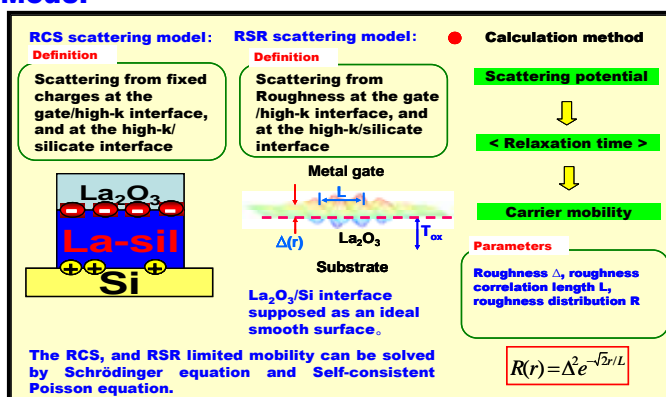
## Purpose



## Materials and Methods

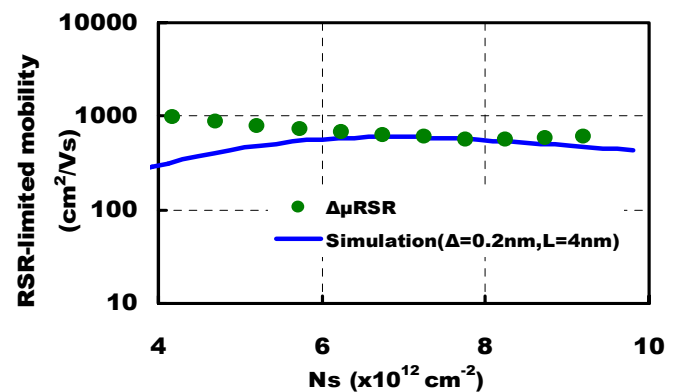
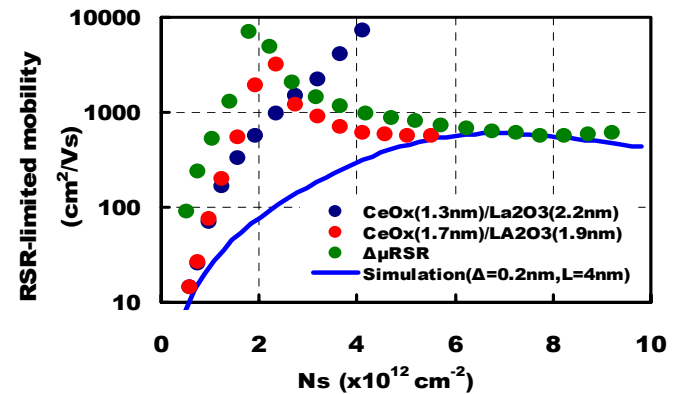
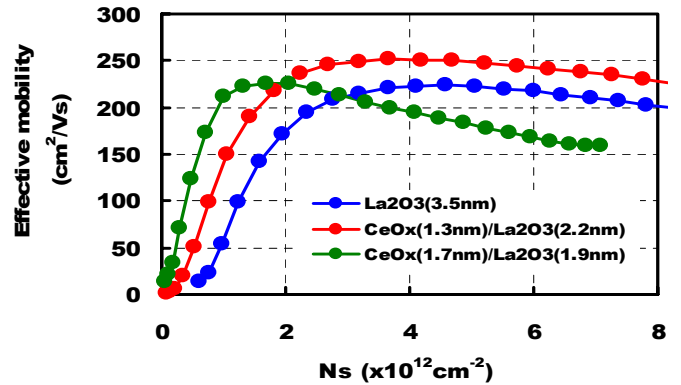


## Model



## Results

RSR- limited electron mobility extracted by Matthiessen's rule, and the result is compared with simulation result.



## Conclusion

➤ For  $\text{CeO}_x/\text{La}_2\text{O}_3$  gate dielectric structure, the remote-Coulomb scattering play dominant role when the physical thickness of the  $\text{La}_2\text{O}_3$  is larger than 2.2nm.

➤ When the interfacial layer too close (the distance is less than 1.7nm) to the channel, the remote surface roughness scattering take dominant role.

## Acknowledgment

This work was supported by NEDO. M.M acknowledges financial supports by NEC C&C.

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