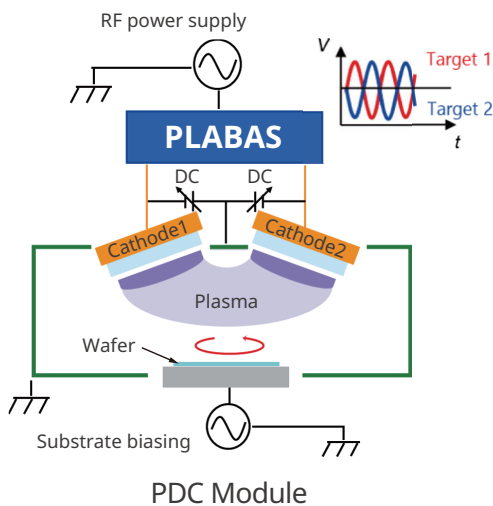


Dielectric Film Sputtering

PLABAS¹⁾ Dual Cathode (PDC) module ensures a highly stable dielectric sputtering process throughout the entire target life. 1) Plasma Balanced System



<Features>

- Stable deposition performance even if the insulating film continues to accumulate on the grounded shield.
- Substrate biasing function enables the improvement of film quality.
- Co-sputtering
 - Precise and flexible composition control
 - Low running costs by using affordable metal targets.



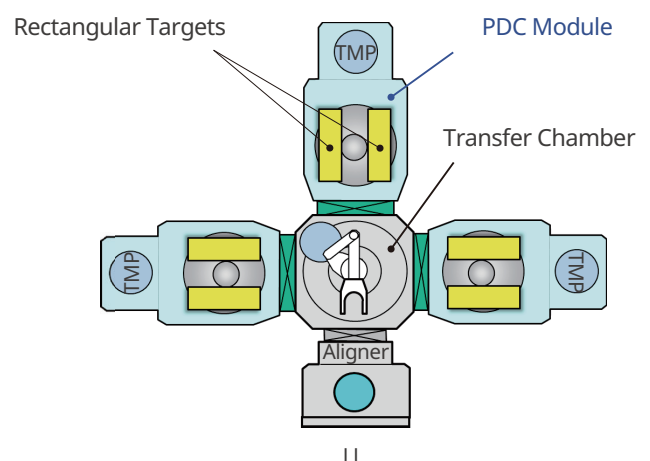
PLABAS Dual Cathode (PDC)

<Applications>

- SiO₂ film as a temperature compensation layer for RF filters (TC-SAW).
- Piezoelectric films for MEMS devices such as PMUTs and microphones. (AlN, AlScN, KNN²⁾, etc.)

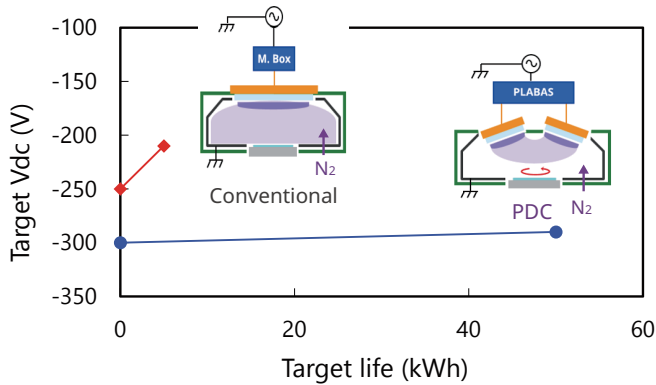
2) (K, Na)NbO₃ , lead-free piezoelectric material

EC7430 Dielectric Film Sputtering System



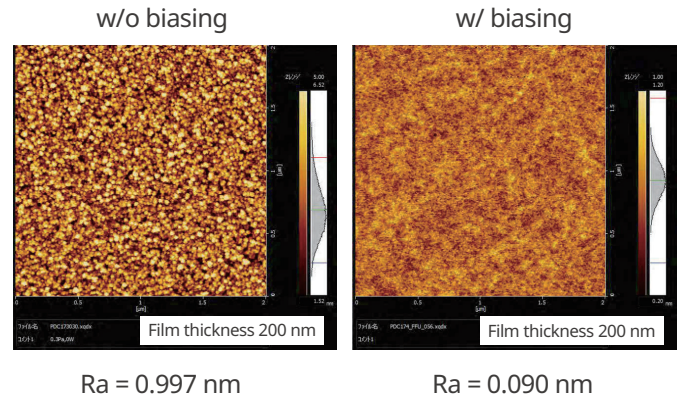
Dielectric Film Sputtering

Advantages of PDC Module



Long-term stability in the AlN deposition process

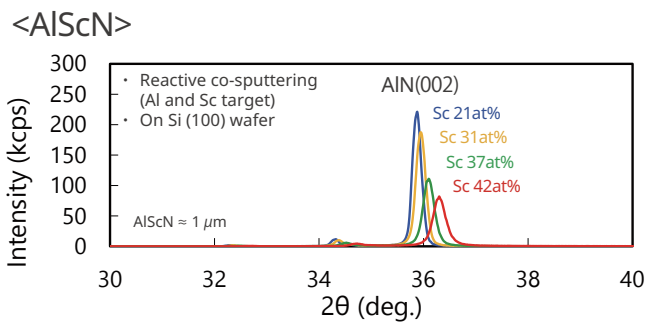
Even if the grounded shield is gradually covered with an insulating film, the plasma remains stable throughout the entire target life.



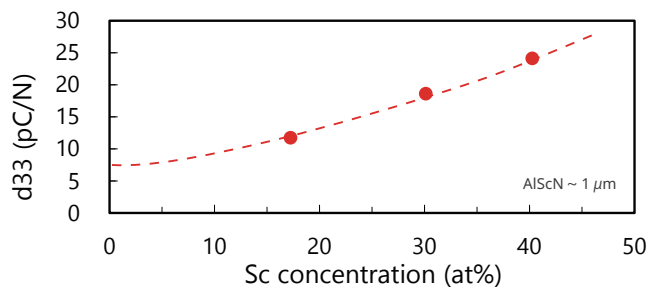
AFM Images of SiO₂ film

Substrate biasing during deposition significantly improves surface smoothness. (~ 0.1 nm)

Application to Piezoelectric Films



Out-of-plane XRD of AlScN

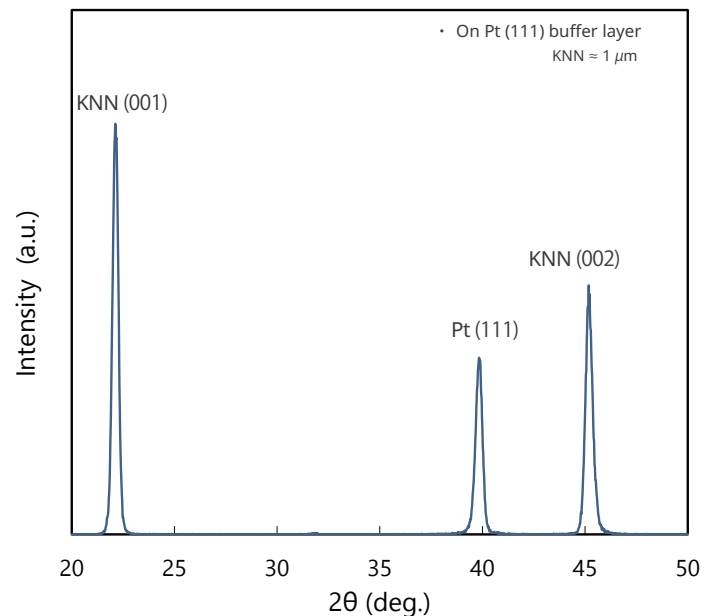


Piezoelectric constant d_{33}

Co-sputtering allows for flexible control of Sc concentration.

High piezoelectric performance is achieved with a high Sc concentration.

<KNN>



Out-of-plane XRD of KNN

(001) oriented KNN can be deposited even on a Pt (111) underlayer.