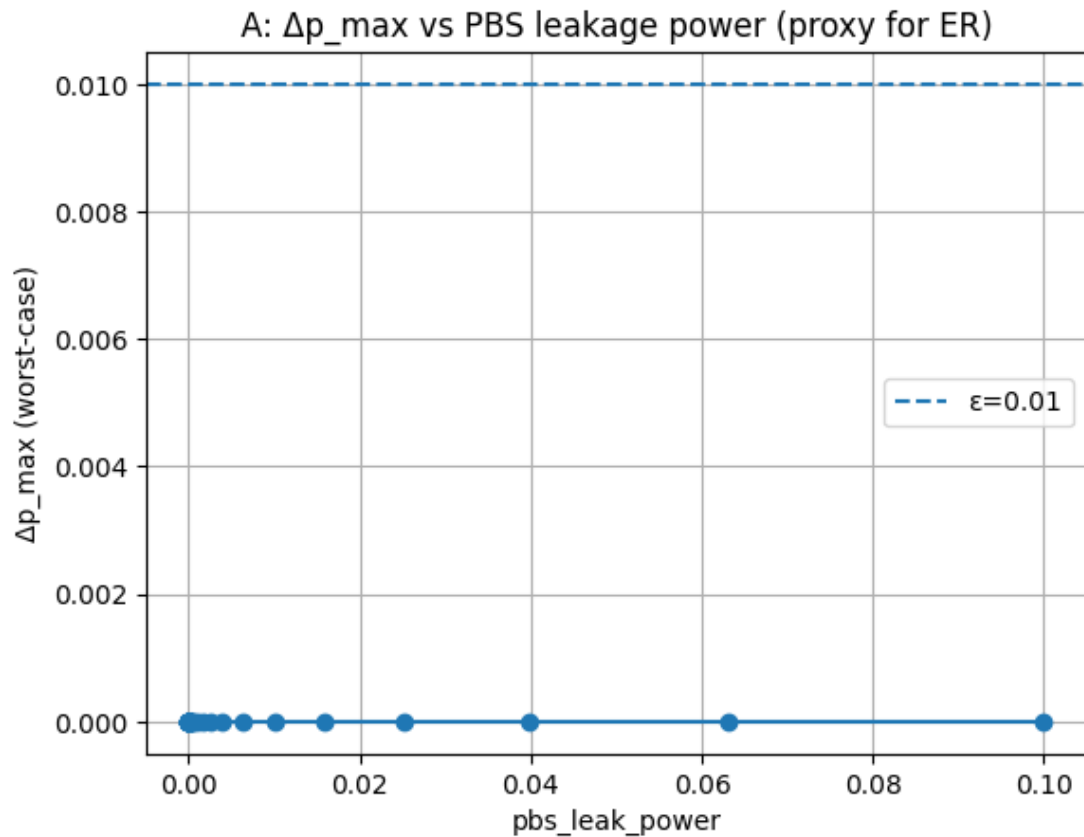


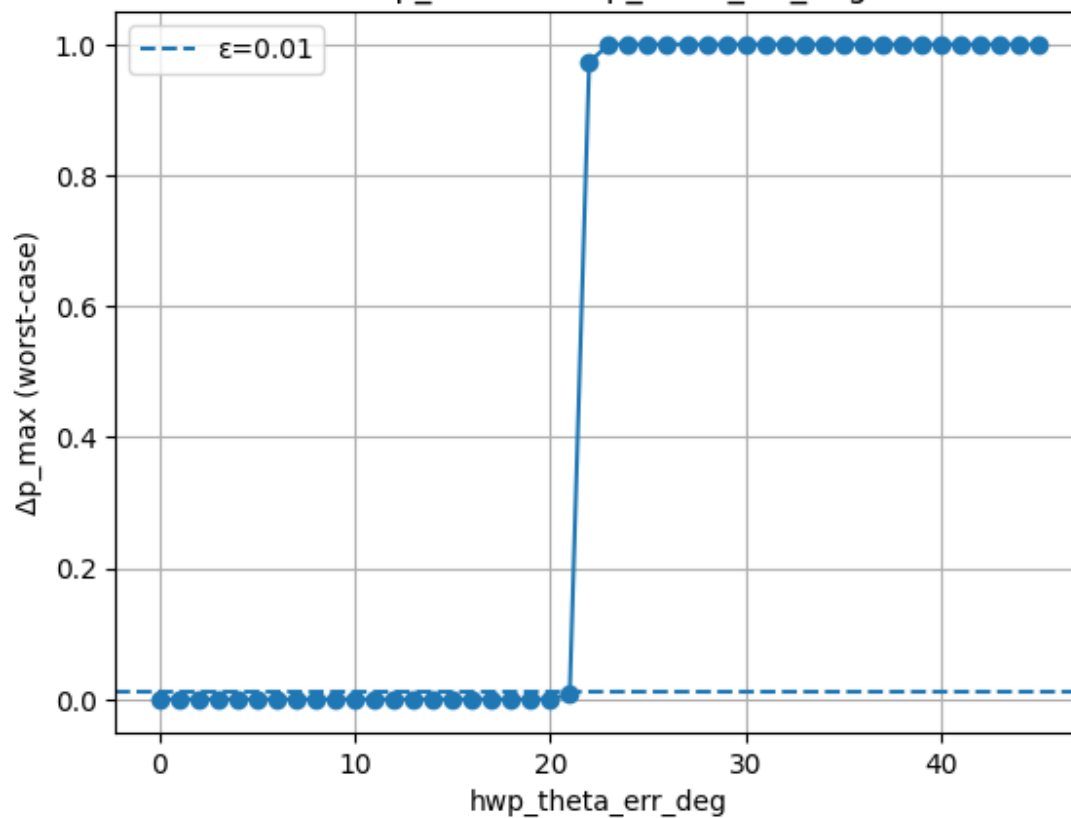
S2.1. Boundary analysis — Architecture A (Δp_{max} tolerance limits) (Δp_{max} tolerance limits)

- **Purpose:** compute **limits of correct probability inversion** via worst-case $\Delta p_{\text{max}} = \max_p | \hat{p}_{\text{out}}(p) - (1 - \hat{p}_{\text{in}}(p)) |$.
- **Threshold:** $\varepsilon = 1\%$ (absolute probability error).
- **Outputs:** tolerance table for $\Delta\theta_{\text{max}}$, $|\Delta\delta|_{\text{max}}$, noise_max, ER_min (and any A-specific parameters such as imbalance).
- **Notes:** the boundary search uses scan + bisection; results should be validated with increased N and multi-seed repeats near the boundary.

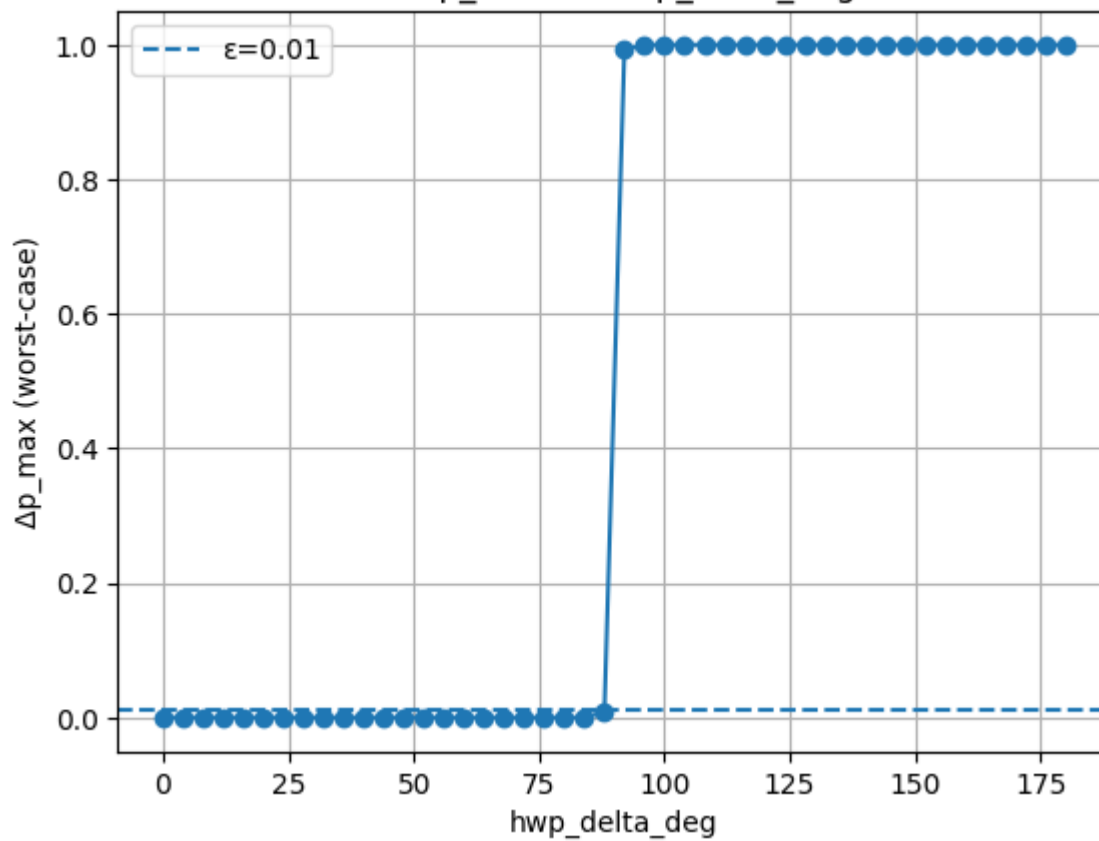
Figures in this PDF: Δp_{max} curves versus key non-idealities and the resulting $\varepsilon=1\%$ tolerance table.

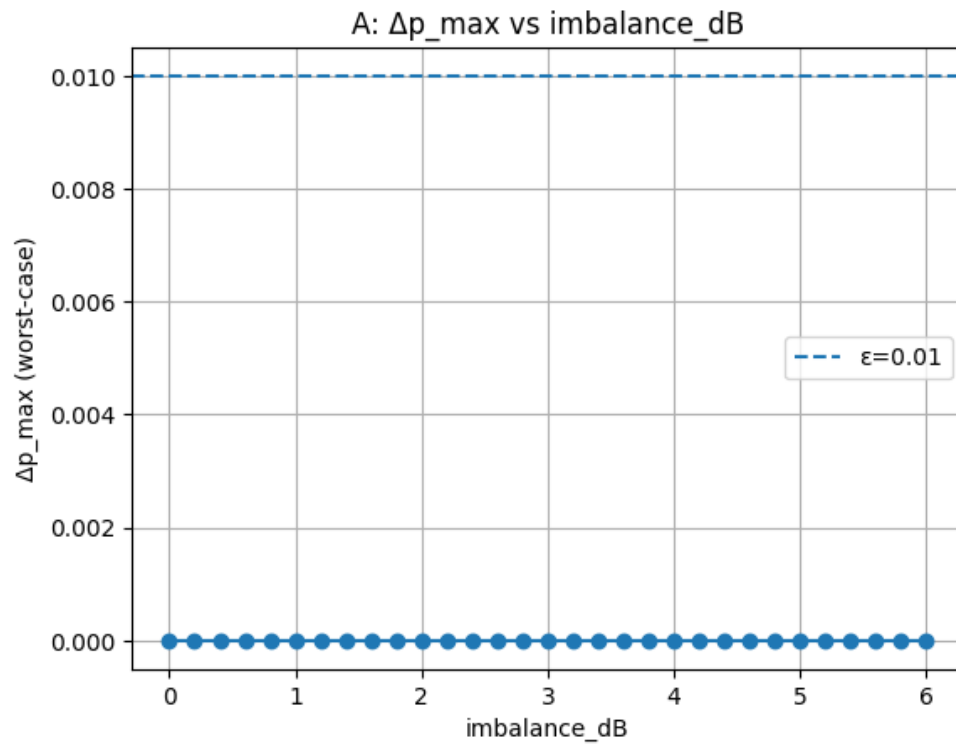
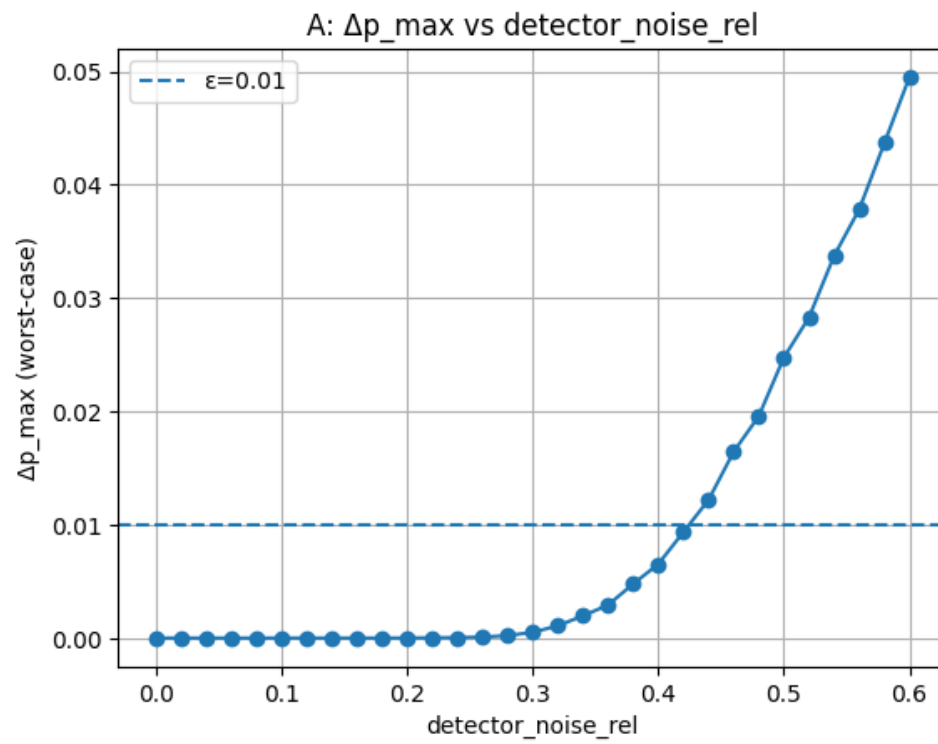


A: Δp_{max} vs hwp_theta_err_deg



A: Δp_{max} vs hwp_delta_deg





```

    eps pbs_ER_min_dB dtheta_max_deg ddelta_max_deg noise_max \
0  0.01      None      21.027344      88.078125      0.424375

    imbalance_max_dB
0      None

```