Methods	Shift Type	Req. Access Beyond calibration (X, Y)	Shift Estimation	FSV Finite Sample Validity	Complexity
Our method	Within LP ball (including all shift)	noise level ϵ, ρ	estimate from a few shifted samples (solve 1-D OT prob.)	Yes	Mild
CP under covariate shift (Tibshirani et. al, 2019)	$P(X)$ changes, $P(Y\|X)$ fixed	$P_{test}(X)/P_{calib}(X)$	Covariate density ratio estimation	$\approx$ (density esti.)	Moderate
CP under label shift (Podkopaev & Ramdas, 2021)	$P(Y)$ chg. $P(X\|Y)$ fixed	$P_{test}(Y)/P_{calib}(Y)$	Estimate $P_{test}(Y)$ (Black Box Shift Estimation)	$\approx$ (density esti.)	Moderate
*** CP under f-divergence shift** (Cauchois et. al, 2024)	Within f-divergence ball (need support inclusion)	Specified f-divergence bound	Assume calibration shift informs test shift (tend to be conservative)	Yes	Mild
*** Adversarial CP with randomized smoothing** (Gendler et. al, 2022)	ℓ_2-norm bounded adversarial noise on X	ℓ_2-norm of noise	No, assume bounded ℓ_2 norm for noise	Yes (for smoothed model)	Moderate
*** Wasserstein-regularized CP** (Xu et. al, 2025)	Test dataset is mixture of calibration datasets	Distribution from original datasets	No, require model training	No	Heavy
*** Identifiable X-shift and $Y\|X$-shift** (Ai & Ren, 2024)	X-shift and conditional shift under f-divergence	Specified f-divergence bound	Estimation of covariate shift and bound conditional shift from	$\approx$ (density esti.)	Mild
CP beyond exchangeability (Barber et. al, 2023)	Arbitrary	Sequential data and weights for observations	Valid weighting scheme!	$\approx$ (weight estimation)	Mild
CP with dependent data (Chernozhukov et. al, 2018)	Serial dependence data with Block exchangeability	Sequential data	No	$\approx$ (asymptotic)	Mild
Adversarial MultiValid Prediction (MVP) (Bastani et. al, 2022)	Online, arbitrary shift	Sequential data	Yes	$\approx$ (with group validity)	Mild
*** Adaptive Conformal Inference (ACI)** (Gibbs & Candès, 2021)	Online, exchangeable or slowly drifting	Sequential data	Heuristic tuning	$\approx$ (Asymptotic)	Light
Online CP with arbitrary shift (Gibbs & Candès, 2024)	Online, arbitrary shift	Sequential data	No-regret online learning	Yes	Mild
*** Sequential CP for time series** (Xu & Xie, 2021)	Online, mild shift	Sequential time series data	Online ensemble weighting	$\approx$ (Asymptotic)	Moderate
Adaptive CP for times series (Zaffran et. al, 2022)	Online, arbitrary shift	Sequential time series data	Bootstrap + residuals	$\approx$ (Asymptotic)	Moderate
*** Distribution shift with a shape constraint** (Gui et. al, 2024)	Shift with isotonic density ratio constraint	Partial order information for isotonic constraint	Density ratio estimation under isotonic constraints	Yes	Moderate
*** Causal conformal prediction** (Lei & Candès, 2021)	Intervention shift (*do*-shift)	(X, T, Y); Propensity scores	Estimate propensity scores	Yes	Mild

Table 1: Comparison with other methods, * marks important papers mentioned by the reviewers;
FSV: finite-sample validity, where $\approx$ implies approximate or asymptotic valid coverage;
Complexity: Light, Mild (1-D optimization, etc.), Moderate (density estimation, etc.), Heavy (training new models);
Orange: CP under different shift models; Green: Exotic CP (online, causal, mixing datasets, time series, etc.)