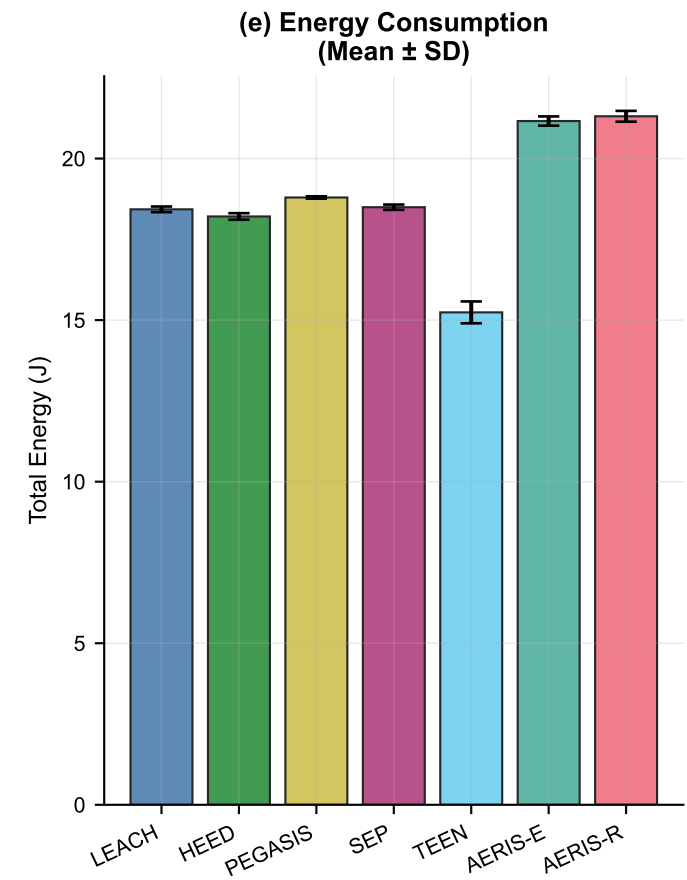
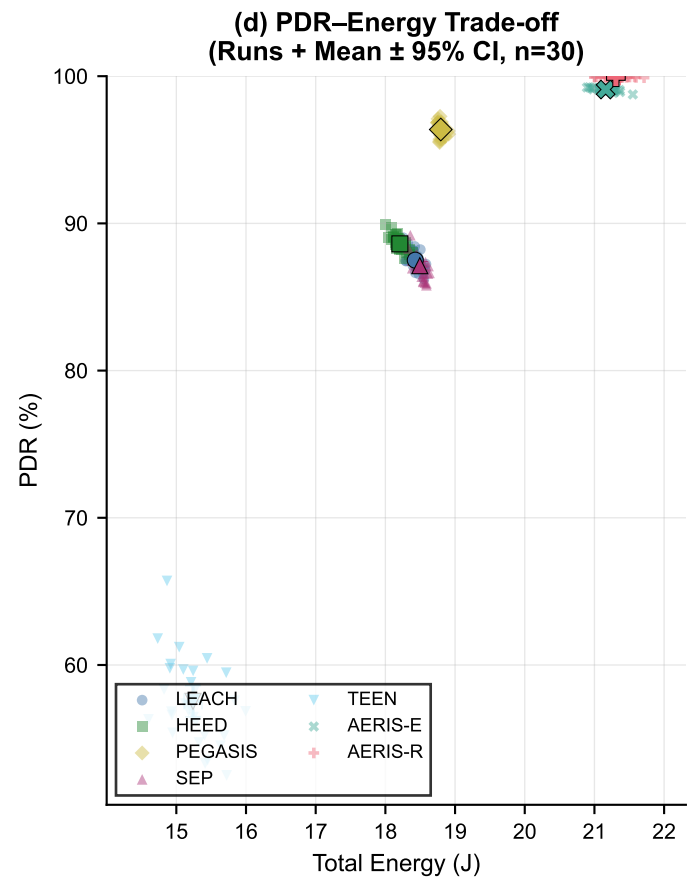
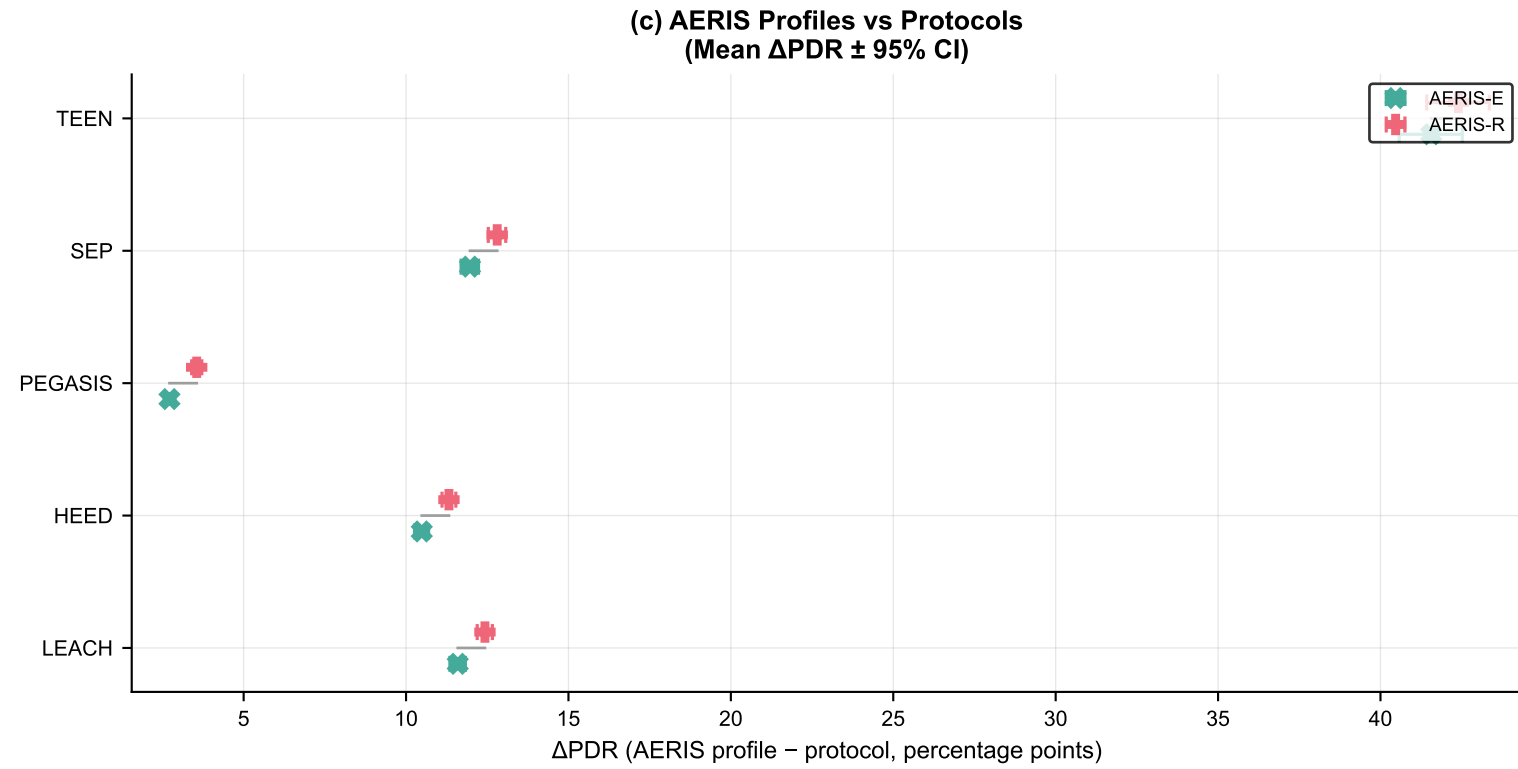
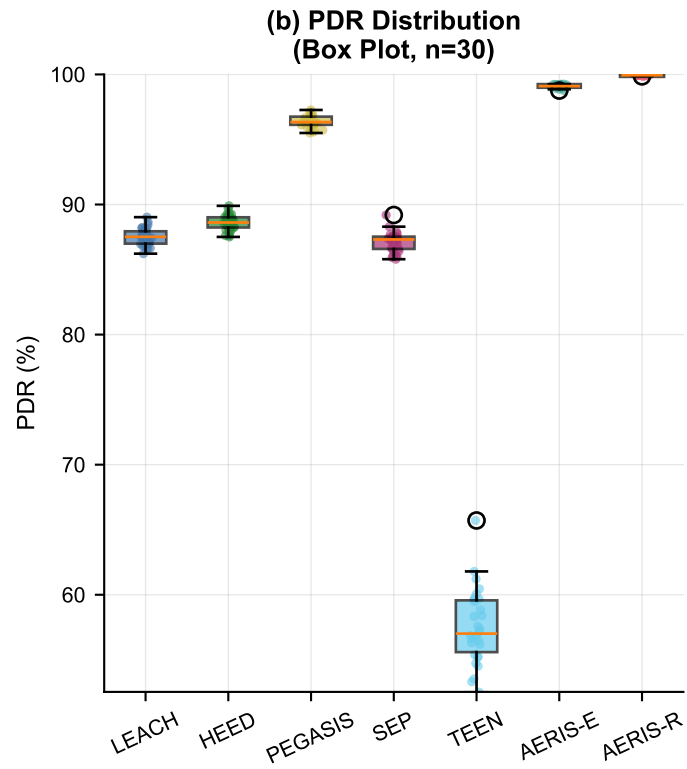
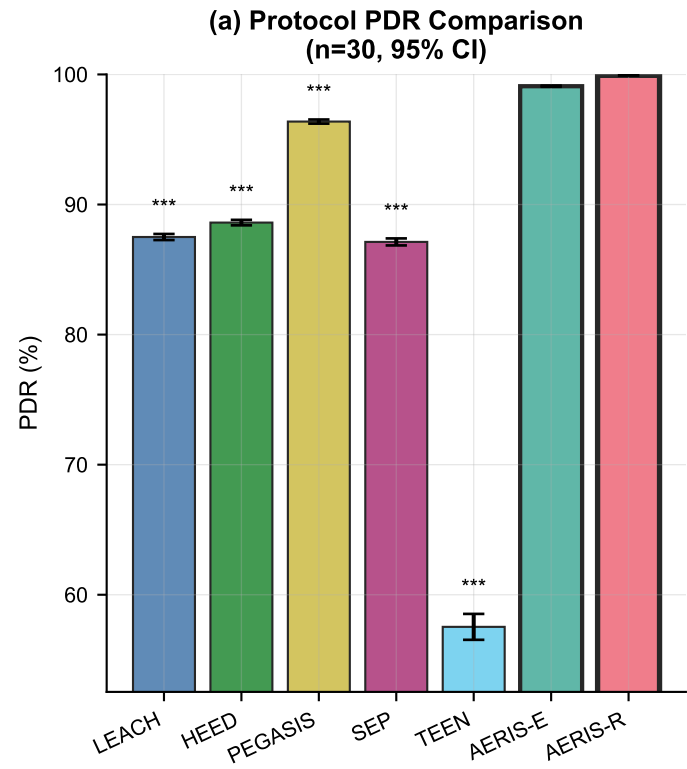


**AERIS: SOTA Protocol Comparison with Rigorous Statistical Testing**  
(Same geometry/energy model; AERIS profiles include full reliability stack, n=30 runs each)



**(f) Statistical Validation Summary**  
(Shapiro–Wilk  $\rightarrow$  Levene  $\rightarrow$  t-test)

Protocol	$\Delta$ PDR-E (pp)	p_E	$\Delta$ PDR-R (pp)	p_R
LEACH	+11.59	3.0e-11	+12.43	1.0e-38
HEED	+10.48	3.0e-11	+11.32	6.2e-39
PEGASIS	+2.72	3.0e-11	+3.55	5.6e-28
SEP	+11.97	3.0e-11	+12.81	2.5e-37
TEEN	+41.56	3.0e-11	+42.40	6.9e-36