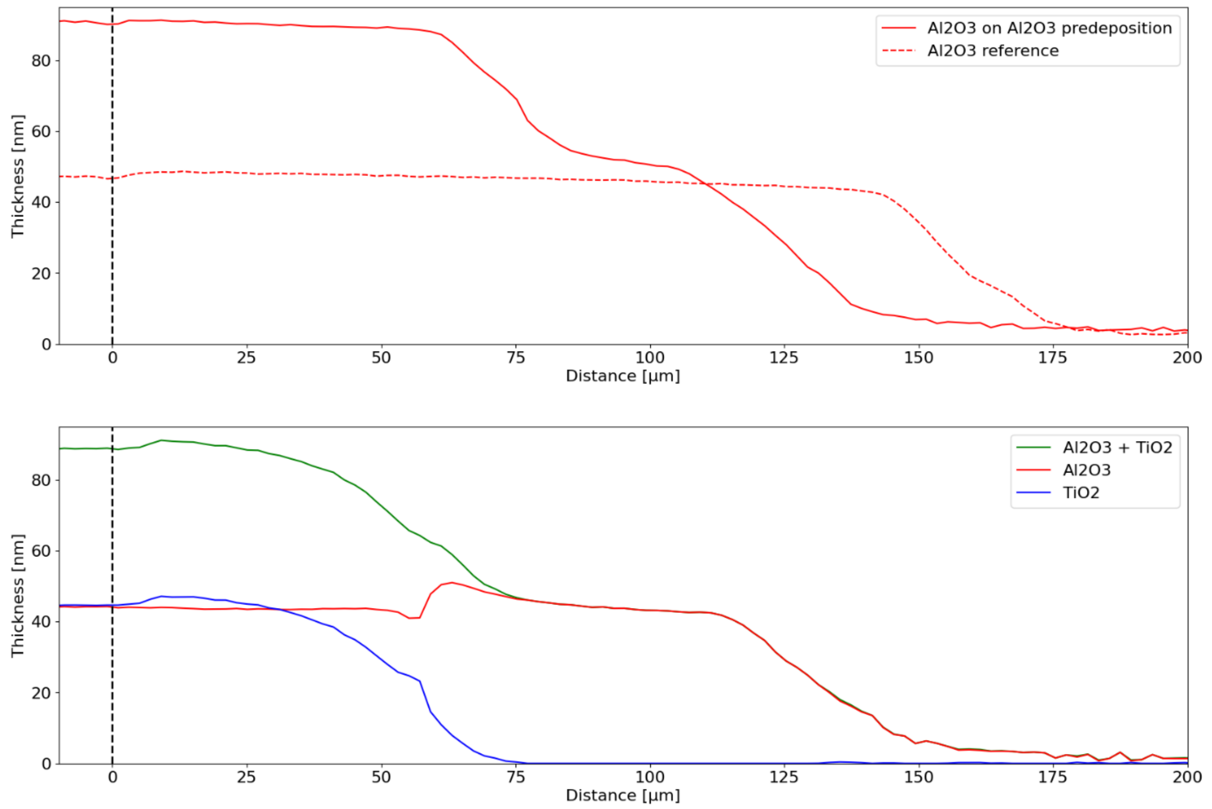


Fig. 1. The film penetration depth profile of $Al_2O_3$ ALD deposition into the horizontal trench with constant gap height of 500 nm (top image: *Al2O3 reference*). The effect of the reduction of the penetration depth based on the 400 nm trench opening is observed after $Al_2O_3$ (top image: *Al2O3 on Al2O3 predeposition*) and after $TiO_2$ (bottom image: *Al2O3 + TiO2*) ALD pre-deposition. The material stack can be separated into the thin film measurement of $TiO_2$ (bottom image). The total reduction of 100nm is since 50nm pre-deposition happens on top and on bottom of the opening.