

Supplementary Material - Band Alignment of Sb_2O_3 and Sb_2Se_3

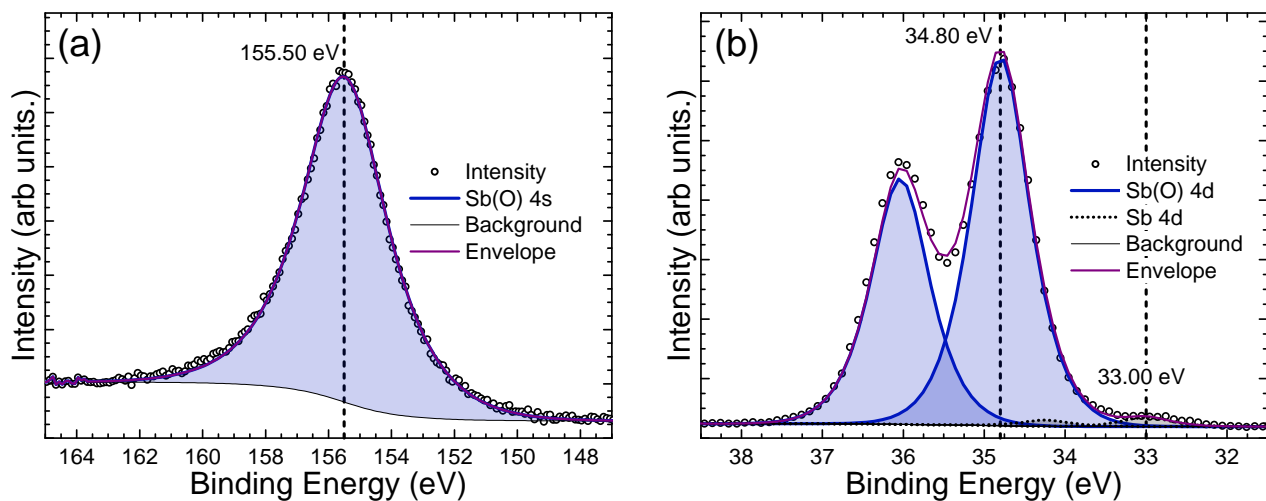


FIG. S1: Core level spectra of (a) Sb 4s and (b) Sb 4d for the Sb_2O_3 thin film.

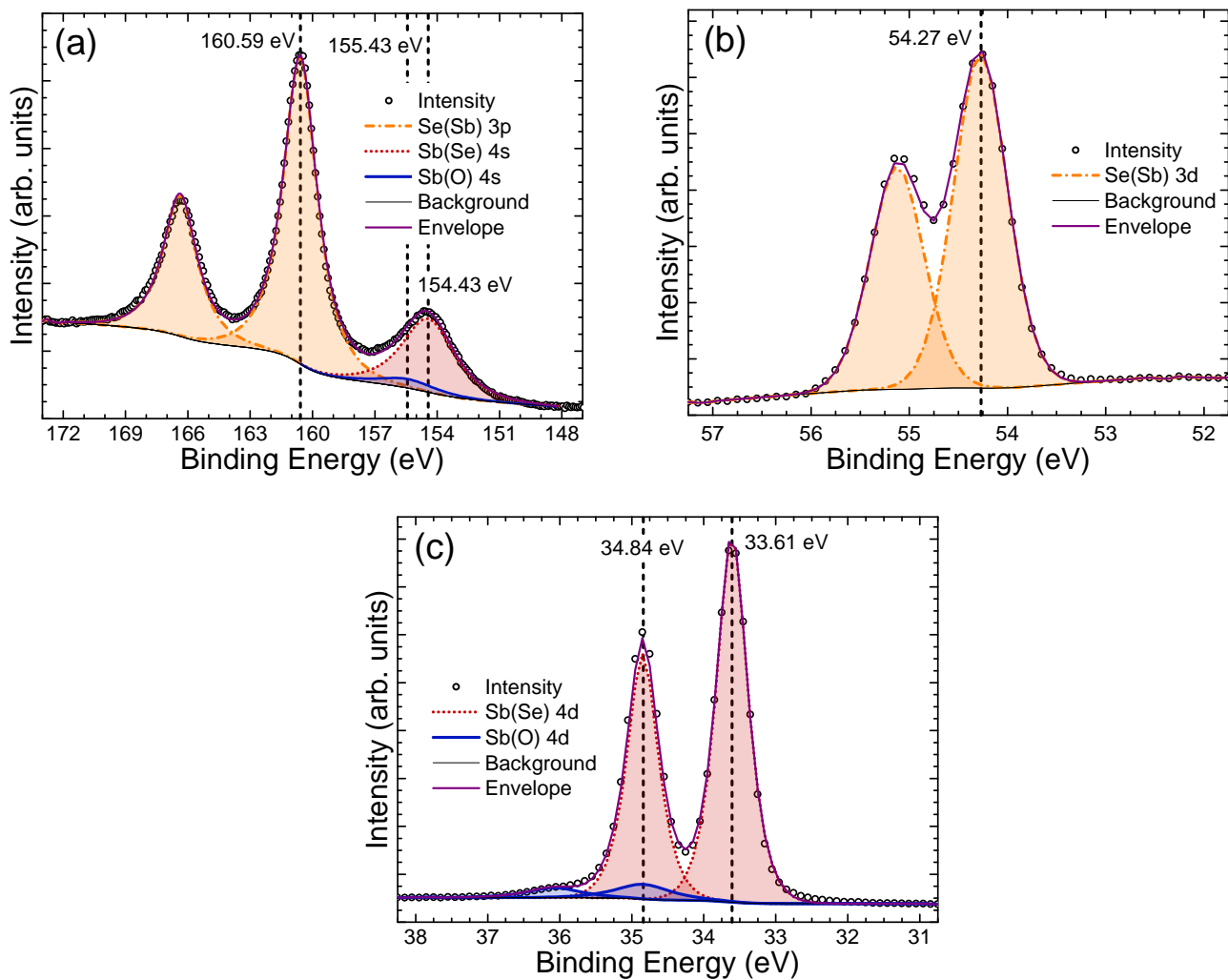


FIG. S2: Core level spectra of (a) Se 3p & Sb 4s (b) Se 3d and (c) Sb 4d for the Sb_2Se_3 thin film.

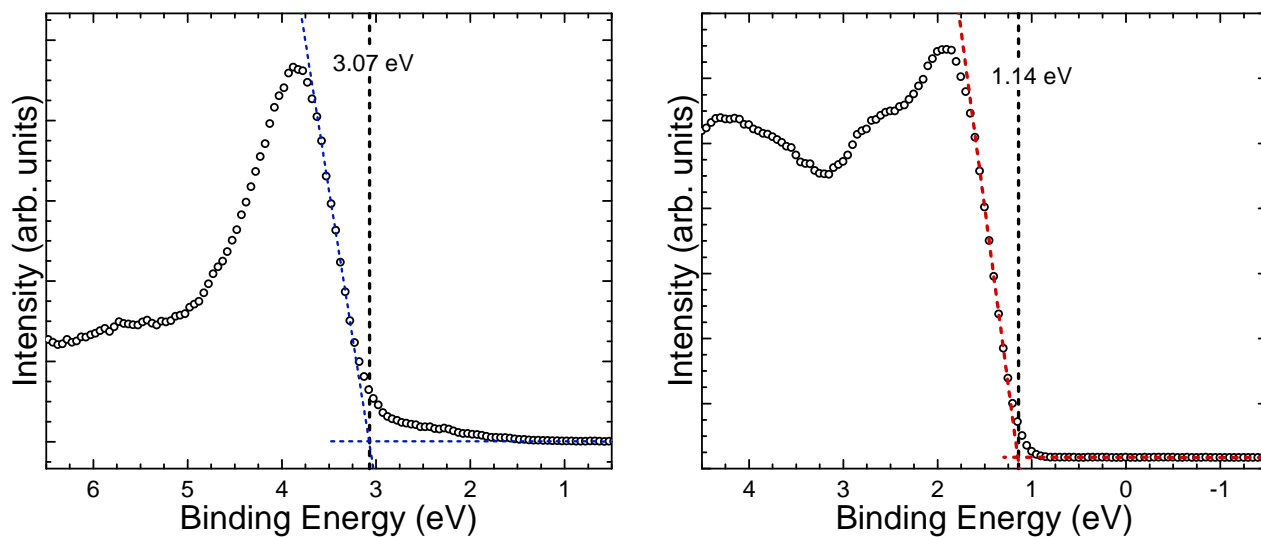


FIG. S3: Valence band spectra of (a) Sb_2O_3 and (b) Sb_2Se_3 thin films.

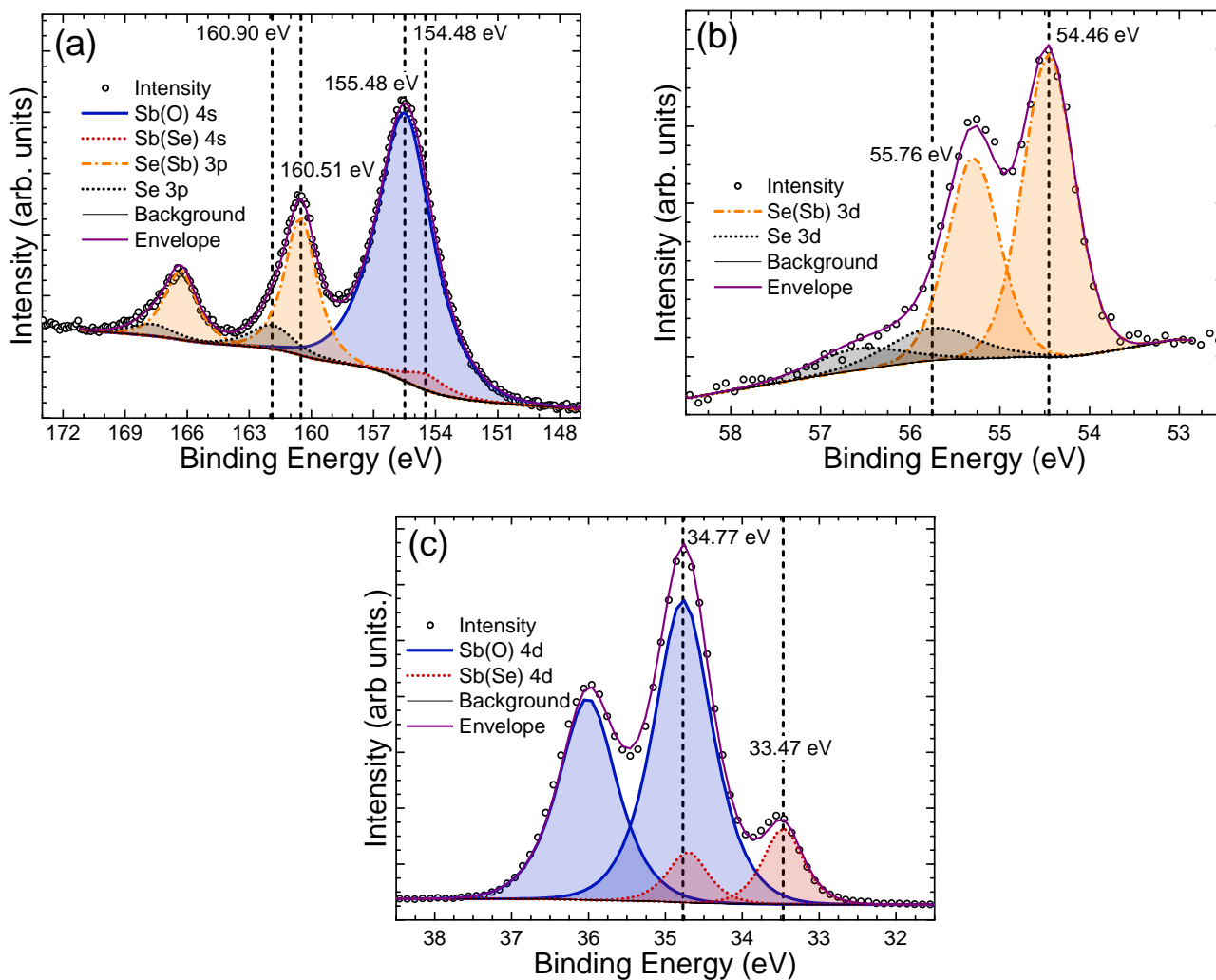


FIG. S4: Core level spectra of (a) Se 3p & Sb 4s (b) Se 3d and (c) Sb 4d for the interfacial $\text{Sb}_2\text{O}_3/\text{Sb}_2\text{Se}_3$ film.

TABLE S1: Peak positions of core levels measured for use in the Kraut method calculations.

Sample	Peak	Energy (eV)
Sb ₂ Se ₃ Film	Sb(Se) 3d _{5/2}	529.68
	Se(Sb) 3p _{3/2}	160.59
	Se(Sb) 3d _{5/2}	54.27
	Sb(Se) 4d _{5/2}	33.61
	VB	1.14
Sb ₂ O ₃ Film	O(Sb) 1s	531.21
	Sb(O) 3d _{5/2}	530.88
	Sb(O) 4s	155.49
	Sb(O) 4d _{5/2}	34.80
	VB	3.07
Sb ₂ O ₃ /Sb ₂ Se ₃	O(Sb) 1s	531.07
	Sb(O) 3d _{5/2}	530.77
	Sb(Se) 3d _{5/2}	529.93
	Se(Sb) 3p _{3/2}	160.51
	Sb(O) 4s	155.48
	Se(Sb) 3d _{5/2}	54.46
	Sb(O) 4d _{5/2}	34.77
	Sb(Se) 4d _{5/2}	33.47

TABLE S2: Table showing the valence band offset calculated by the Kraut method using different combinations of core level peaks from Sb₂O₃ (columns) and Sb₂Se₃ (rows).

Peaks Used	Binding Energy (eV)			
	O(Sb) 1s	Sb(O) 3d	Sb(O) 4s	Sb(O) 4d
Sb(Se) 3d _{5/2}	-1.91	-1.93	-2.02	-2.00
Se(Sb) 3p _{3/2}	-1.89	-1.90	-2.00	-1.98
Se(Sb) 3d _{5/2}	-1.63	-1.65	-1.74	-1.72
Sb(Se) 4d _{5/2}	-1.96	-1.97	-2.06	-2.04