1   Table S1. The seasonal variation of fitting parameters α1-α6 obtained from both multilinear and nonlinear fitting approaches.

Area	Season	Nonlinear fit						Multilinear regression fit					
		α1	α2	α3	α4	α5	α6	α1	α2	α3	α4	α5	α6
Arabian Sea	Winter	0.158	0.023	0.376	0.232	0.199	0.943	0.098	0.101	0.002	0.005	1.000	0.303
	Pre-Monsoon	0.136	0.021	-0.046	0.205	0.201	0.888	0.089	0.067	0.008	0.010	1.000	0.416
	Monsoon	0.109	0.029	-0.046	0.395	0.201	0.888	0.092	0.049	0.009	0.012	1.000	0.422
	Post-Monsoon	0.154	0.026	0.108	0.010	1.192	0.172	0.091	0.097	0.044	0.024	1.000	0.558
Bay of Bengal	Winter	0.158	0.024	-0.084	0.209	0.140	0.652	0.100	0.084	0.345	0.088	1.000	0.136
	Pre-Monsoon	0.127	0.012	-0.043	0.081	0.081	0.474	0.092	0.060	0.004	0.002	1.000	0.324
	Monsoon	0.126	0.011	-0.398	0.415	0.006	0.473	0.095	0.046	0.011	0.005	1.000	0.414
	Post-Monsoon	0.150	0.020	0.331	0.311	0.119	1.097	0.100	0.071	0.014	0.007	1.000	0.364
Central India	Winter	0.215	0.010	-0.278	0.685	0.105	1.236	0.187	0.026	0.079	0.084	1.000	0.269
	Pre-Monsoon	0.183	0.003	-0.259	0.662	0.099	1.339	0.171	0.018	0.020	0.009	1.000	0.278
	Monsoon	0.187	0.007	0.322	0.390	0.098	0.555	0.168	0.024	0.002	0.005	1.000	0.319
	Post-Monsoon	0.210	0.016	-0.291	0.684	0.105	1.444	0.174	0.042	0.000	0.005	1.000	0.253

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Table S2. Mean seasonal variation of anthropogenic and natural fraction of aerosol optical depth over all three regions estimated using methodology by Kim et al., (2007).

|	Arabian Sea (AS)		Bay of Bengal (BOB)		Central India (CI)	
	Anthro[*]	Nat[*]	Anthro	Nat	Anthro	Nat
Winter	0.146±0.029	0.112±0.022	0.16±0.032	0.142±0.028	0.376±0.055	0.279±0.056
Pre-Monsoon	0.305±0.061	0.347±0.069	0.309±0.062	0.327±0.065	0.407±0.081	0.46±0.092
Monsoon	0.113±0.023	0.346±0.069	0.16±0.032	0.276±0.055	0.435±0.087	0.655±0.101
Post-Monsoon	0.309±0.062	0.298±0.059	0.305±0.061	0.234±0.046	0.627±0.095	0.505±0.089

[*]Anthro represents anthropogenic and Nat represents natural

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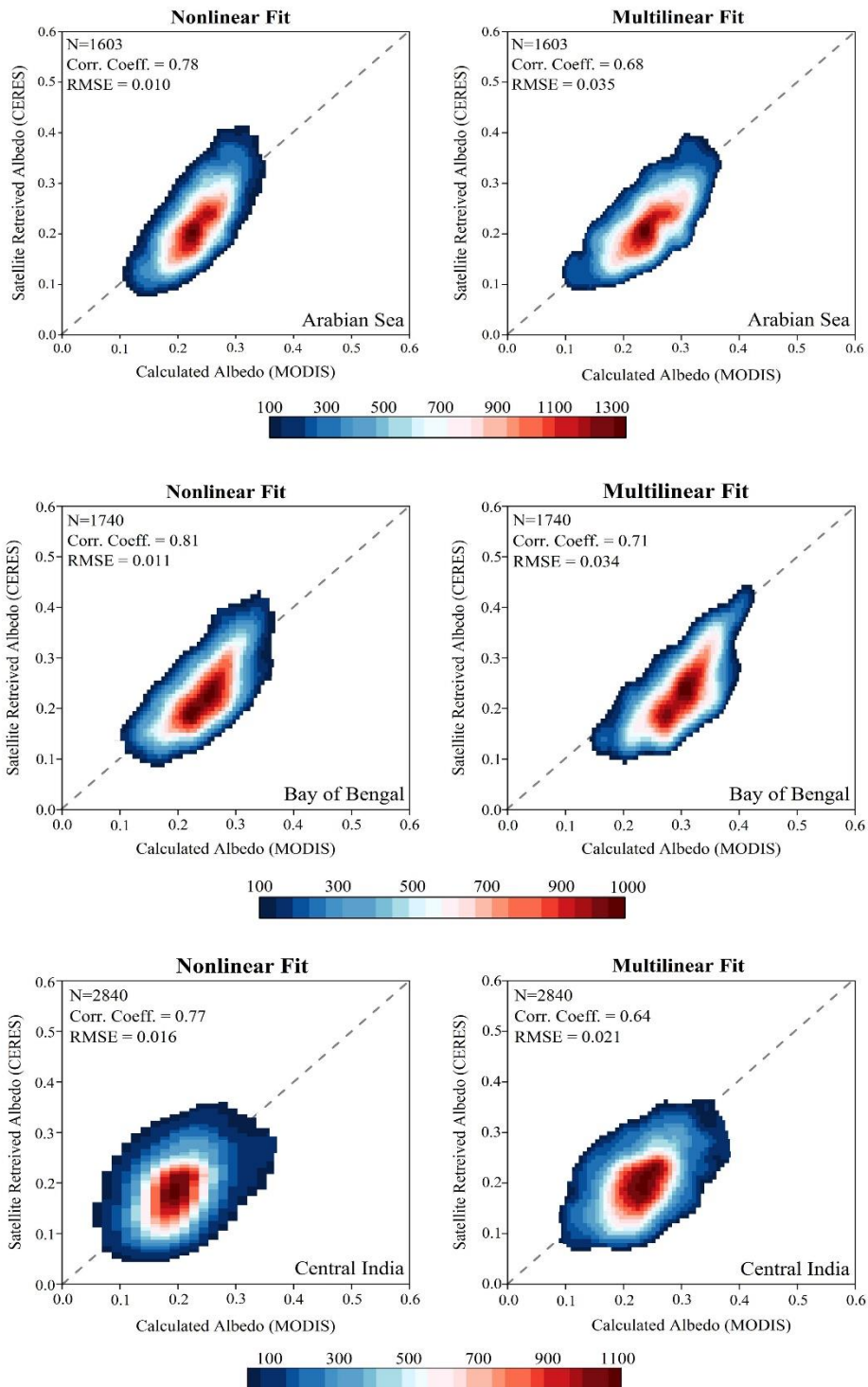
Figure S3. Scatter density plots CERES-retrieved α vs. calculated α for all three regions.

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