

Bit	Value	V3 interpretation	V4 interpretation
0	0	Unconstrained retrieval; initial lidar ratio unchanged during retrieval process.	Unconstrained retrieval; initial lidar ratio unchanged during retrieval process.
0	1	Constrained retrieval. Solution is constrained by measured two-way transmittance.	Constrained retrieval. Solution is constrained by measured two-way transmittance.
1	2	Initial lidar ratio reduced to prevent divergence of solution to infinity.	Initial lidar ratio reduced to achieve successful solutions for backscatter coefficients and uncertainties throughout the full vertical extent of the layer
2	4	Initial lidar ratio increased to reduce the number of negative backscatter coefficients retrieved for non-negative attenuated backscatter measurements.	Suspicious retrieval (layer or overlying integrated attenuated backscatter too high or lidar ratio reduction excessive)
3	8	Retrieved backscatter exceeds maximum allowable value. Solution terminated.	Lidar ratio has been reduced and has converged but backscatter uncertainty solution still does not exist.
4	16	Feature has been identified by feature finder as being totally attenuating (opaque).	Feature has been identified by feature finder as being totally attenuating (opaque).
5	32	Estimated optical depth uncertainty exceeds maximum allowable value.	Lidar ratio has converged but constrained retrieval still not achieved.
6	64	Lidar ratio has converged but solution still diverging high or low.	Feature has a negative signal anomaly. (Tackett et al., 2018)
7	128	Retrieval terminated at maximum allowable iterations.	Maximum number of attempts at constrained retrieval exceeded.
8	256	No solution possible within acceptable lidar ratio bounds.	No valid solutions exist within acceptable lidar ratio bounds.
9	512	Unused	Denominator (transmittance) of lidar ratio adjustment factor converged but constrained retrieval still not achieved.
10	1024	Unused	Backscatter solution not achieved but maximum lidar ratio adjustments reached.
11	2048	Unused	Backscatter uncertainty solution not achieved but maximum lidar ratio adjustments reached.
12	4096	Unused	Lidar ratio has been reduced and has converged but backscatter solution still not achieved.
13	8192	Unused	Unused
14	16384	Unused	Complex feature retrieval failure (see YV09).
15	32768	Fill value or no solution attempted.	Fill value or no solution attempted.