Table 1. A contrast between QAA_v4 and QAA_v5

	$r_{rs}(\lambda) = R_{rs}(\lambda)/(0.52 + 1.7\,R_{rs}(\lambda))$	
$u = b_b/(a+b_b)$	$r_{rs}(\lambda) = \left(g_0 + g_1 u(\lambda)\right)u(\lambda)$ $u(\lambda) = \dfrac{-g_0 + \sqrt{(g_0)^2 + 4g_1 * r_{rs}(\lambda)}}{2g_1}$; g_0=0.089,g_1=0.125	
	QAA_v5	**QAA_v4**
λ_0 = 550; 555; 560	$\chi = \log\left(\dfrac{r_{rs}(443) + r_{rs}(490)}{r_{rs}(\lambda_0) + 5\dfrac{r_{rs}(667)}{r_{rs}(490)}r_{rs}(667)}\right)$, $a(\lambda_0) = a_w(\lambda_0) + 10^{-1.146-1.366\,\chi-0.469\,\chi^2}$	$\chi = \log\left(\dfrac{r_{rs}(443) + r_{rs}(490)}{r_{rs}(\lambda_0) + 2\dfrac{r_{rs}(640)}{r_{rs}(490)}r_{rs}(640)}\right)$, $a(\lambda_0) = a_w(\lambda_0) + 10^{h0+h1\chi+h2\chi^2}$
Exponent of $b_{bp}(\lambda)$	$\eta = 2.0\left(1-1.2\ \exp\left(-0.9\dfrac{r_{rs}(443)}{r_{rs}(\lambda_0)}\right)\right)$	$\eta = 2.2\left(1-1.2\ \exp\left(-0.9\dfrac{r_{rs}(443)}{r_{rs}(555)}\right)\right)$
ζ: $a_{ph}411/a_{ph}443$	$\zeta = 0.74 + \dfrac{0.2}{0.8 + r_{rs}(443)/r_{rs}(\lambda_0)}$	$\zeta = 0.71 + \dfrac{0.06}{0.8 + r_{rs}(443)/r_{rs}(555)}$
ξ: $a_{dg}411/a_{dg}443$	$\xi = e^{S(443-411)}$, $S = 0.015 + \dfrac{0.002}{0.6 + r_{rs}(443)/r_{rs}(\lambda_0)}$	$\xi = e^{S(443-411)}$, $S = 0.015$
Upper limit for $R_{rs}(667)$	$R_{rs}(667) = 20.0\left(R_{rs}(\lambda_0)\right)^{1.5}$	$R_{rs}(640) = 0.01R_{rs}(555) + 1.4R_{rs}(667) - 0.0005\dfrac{R_{rs}(667)}{R_{rs}(490)}$
Lower limit for $R_{rs}(667)$	$R_{rs}(667) = 0.9\left(R_{rs}(\lambda_0)\right)^{1.7}$	
If no $R_{rs}(667)$ measurements or measured $R_{rs}(667)$ out of the limits	$R_{rs}(667) = 1.27\left(R_{rs}(\lambda_0)\right)^{1.47} + 0.00018\left(\dfrac{R_{rs}(490)}{R_{rs}(\lambda_0)}\right)^{3.19}$	

Update of the Quasi-Analytical Algorithm (QAA_v6)

	$r_{rs}(\lambda) = R_{rs}(\lambda)/(0.52 + 1.7\, R_{rs}(\lambda))$	
	$u(\lambda) = \dfrac{-g_0 + \sqrt{(g_0)^2 + 4g_0 * g_1 * r_{rs}(\lambda)}}{2g_1}$, where g_0=0.089 and g_1=0.1245	
	IF $R_{rs}(665) < 0.0015$ sr^{-1}	**(else)**
2	$\chi = \log\left(\dfrac{r_{rs}(443) + r_{rs}(490)}{r_{rs}(560) + 5\dfrac{r_{rs}(665)}{r_{rs}(490)} r_{rs}(665)}\right)$ $a(\lambda_0) = a(560) = a_w(\lambda_0) + 10^{h0 + h1\chi + h2\chi^2}$ $h_0 = -1.146$ $h1 = -1.366$ $h_2 = -0.469$	a total $a(\lambda_0) = a(665)$ $= a_w(665) + 0.39\left(\dfrac{Rrs(665)}{Rrs(443) + Rrs(490)}\right)^{1.14}$
3	$b_{bp}(\lambda_0) = b_{bp}(560) = \dfrac{u(\lambda_0) \times a(\lambda_0)}{1 - u(\lambda_0)} - b_{bw}(560)$	a_{665} $b_{bp}(\lambda_0) = b_{bp}(665) = \dfrac{u(\lambda_0) \times a(\lambda_0)}{1 - u(\lambda_0)} - b_{bw}(665)$
4	$\eta = 2.0\left(1 - 1.2\ \exp\left(-0.9\dfrac{r_{rs}(443)}{r_{rs}(560)}\right)\right)$ → longer wavelength	
5	$b_{bp}(\lambda) = b_{bp}(\lambda_0)\left(\dfrac{\lambda_0}{\lambda}\right)^{\eta}$	
6	$a(\lambda) = (1 - u(\lambda))(b_{bw}(\lambda) + b_{bp}(\lambda))/u(\lambda)$	
7 & 8	$\zeta = 0.74 + \dfrac{0.02}{0.8 + r_{rs}(443)/r_{rs}(560)}$ $\xi = e^{S(4425-415.5)}, S = 0.015 + \dfrac{0.002}{0.6 + r_{rs}(443)/r_{rs}(560)}$	
9 & 10	$a_g(443) = \dfrac{a(416) - \zeta a(443)}{\xi - \zeta} - \dfrac{a_w(416) - \zeta a_w(443)}{\xi - \zeta}$ $a_{dg}(\lambda) = a_g(443)e^{-S(\lambda - 443)}$, $a_{ph}(\lambda) = a(\lambda) - a_{dg}(\lambda) - a_w(443)$	

λ):