Standard Model three-loop Yukawa coupling beta-functions

The attached Files contain the results in computer readable form. We use the following notation:

a1	a2	as	lam	at	ab	atau
$\frac{5}{3}\frac{g_1^2}{16\pi^2}$	$\frac{g_2^2}{16\pi^2}$	$\frac{g_s^2}{16\pi^2}$	$\frac{\lambda}{16\pi^2}$	$\frac{y_t^2}{16\pi^2}$	$\frac{y_b^2}{16\pi^2}$	$\frac{y_\tau^2}{16\pi^2}$

Gauge field propagator definition is the following:

$$\frac{1}{k^2 - M_V^2}\left[g_{\mu\nu} - (1-\xi_Q)\frac{k_\mu k_\nu}{k^2 - \xi_Q M_V^2}\right]$$

NG	xiB	xiW	xiG	z3
n_G	ξ_B	ξ_W	ξ_G	$\zeta(3)$

Beta-function is defined through:

$$\beta_i(a_k) = \left.\frac{da_i(\mu,\epsilon)}{d\ln\mu^2}\right|_{\epsilon=0}$$

Notation for beta-functions and renormalization constants:

bat	bab	batau	Zat	Zab	Zatau
β_{a_t}	β_{a_b}	β_{a_τ}	Z_{a_t}	Z_{a_b}	Z_{a_τ}

For convenience a power counting variable h is introduced in the expressions. The power h^{2l} corresponds to the l-loop contribution.

The beta-functions are in file `betayu.m`, the renormalization constants can be found in `Zyu.m`. The results for SM gauge couplings may be obtained from `http://arxiv.org/src/1210.6873/anc/` and the results for the Higg self-coupling and mass parameter are available from `http://arxiv.org/src/1303.4364/anc/`.