Description of `AnDimSquark.m`

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In the Mathematica file `AnDimSquark.m` the renormalization constants and anomalous dimensions of the squark sector are listed to three-loop order in SUSY QCD.
`AnDimSquark.m` contains the results of the following quantities

Symbol in `AnDimSquark.m`	quantity
Zmst1	$Z_{m_{\tilde{t}_1}}$
Zmst2	$Z_{m_{\tilde{t}_2}}$
dThetat	$\delta\theta_t$
Zmsq	$Z_{m_{\tilde{q}}}$
Zmes	Z_{m_ϵ}
gamThetat	γ_{θ_t}
gamMst1	$\gamma_{m_{\tilde{t}_1}}$
gamMst2	$\gamma_{m_{\tilde{t}_2}}$
gamMsq	$\gamma_{m_{\tilde{q}}}$
gamMst1DRbarPrime	$\gamma^{\overline{\rm DR}'}_{m_{\tilde{t}_1}}$
gamMst2DRbarPrime	$\gamma^{\overline{\rm DR}'}_{m_{\tilde{t}_2}}$
gamMsqDRbarPrime	$\gamma^{\overline{\rm DR}'}_{m_{\tilde{q}}}$
gamMst1withMeOS	$\gamma^{M_\epsilon}_{m_{\tilde{t}_1}}$
gamMst2withMeOS	$\gamma^{M_\epsilon}_{m_{\tilde{t}_2}}$
gamMsqwithMeOS	$\gamma^{M_\epsilon}_{m_{\tilde{q}}}$
gamAt	γ_{A_t}
gamMQ	$\gamma_{M_{\tilde{Q}}}$
gamMU	$\gamma_{M_{\tilde{U}}}$
gamMQDRbarPrime	$\gamma^{\overline{\rm DR}'}_{M_{\tilde{Q}}}$
gamMUDRbarPrime	$\gamma^{\overline{\rm DR}'}_{M_{\tilde{U}}}$

where the precise definition is given in Ref. [1], except for the following

quantities:

$$\frac{\mu^2}{M_{\tilde{Q}}^2}\frac{d}{d\mu^2}M_{\tilde{Q}}^2 = \gamma_{M_{\tilde{Q}}}$$
$$\frac{\mu^2}{M_{\tilde{U}}^2}\frac{d}{d\mu^2}M_{\tilde{U}}^2 = \gamma_{M_{\tilde{U}}}\,.$$

Z_{m_ϵ} is the two-loop renormalization constant for the ϵ-scalar mass in the $\overline{\rm DR}$ scheme,

$$(m_\epsilon^{(0)})^2 = m_\epsilon^2\, Z_{m_\epsilon}\,.$$

`gamMst1withMeOS` is the anomalous dimension of $\tilde{t}_1$ in the $\overline{\rm DR}$ scheme where the ϵ scalar mass is renormalized in the on-shell scheme and terms up to order $\mathcal{O}(M_\epsilon^6)$ are kept. `gamMst2withMeOS` can be derived from `gamMst1withMeOS` by interchanging $m_{\tilde{1}}$ and $m_{\tilde{2}}$ and changing θ_t to $-\theta_t$.

If you use any of the contents of this file, please refer to Ref. [1] in the corresponding publication.

The following notation has been used:

as	$\frac{\alpha_s}{\pi}$
ep	ϵ
z3	$\zeta(3)$
CF	C_F
CA	C_A
Tf	T_f

Mst1	$m_{\tilde{t}_1}$
Mst2	$m_{\tilde{t}_2}$
Msq	$m_{\tilde{q}}$
Mfg	$m_{\tilde{g}}$
Mt	m_t
Me	m_ϵ
MeOS	M_ϵ
cthetat	$\cos\theta_t$
sthetat	$\sin\theta_t$

MQ	$M_{\tilde{Q}}$
MU	$M_{\tilde{U}}$
MQ1	$M_{\tilde{Q}_1}$
MQ2	$M_{\tilde{Q}_2}$
MU1	$M_{\tilde{U}_1}$
MU2	$M_{\tilde{U}_2}$
MD1	$M_{\tilde{D}_1}$
MD2	$M_{\tilde{D}_2}$
MD3	$M_{\tilde{D}_3}$

M_ϵ is the on-shell ϵ-scalar mass.

References

[1] T. Hermann, L. Mihaila, and M. Steinhauser "Three-loop anomalous dimensions for squarks in supersymmetric QCD," SFB/CPP-11-27, TTP11-16.