Decomposition of $\mathrm{Fr}_* \mathcal{O}_{\mathrm{Gr}(2,n)}$

Theorem (R-Špenko-Van den Bergh)

$$\mathrm{Fr}_* \mathcal{O}_{\mathbb{G}} \cong \bigoplus_{j=1}^{n-3} \bigoplus_{\substack{t\in\mathcal{N}, q_t=0, j\equiv 0\ (2) \text{ or} \\ q_t=p-2, j\equiv 1\ (2), \\ j/2+d_t/(2p)\in\mathbb{N}}} \wedge^j \mathcal{R}(-j/2 - d_t/(2p))^{\oplus n_t} \oplus \bigoplus_{\substack{t\in\mathcal{M}, q_t=0, \\ \mathfrak{s}=(-)_\ell \text{ or } \mathfrak{s}=(+)_\ell, \\ d_t^{\mathfrak{s}}/(2p)\in\mathbb{N}}} \mathcal{O}(-d_t^{\mathfrak{s}}/(2p))^{\oplus n_t}$$

$$\oplus \bigoplus_{\substack{t\in\mathcal{M}, q_t-2p+2\equiv 0\ (p),\ q_t\neq p-2, \\ \mathfrak{s}\in\mathfrak{S}_t, \\ (q_t-2p+2+d_t^{\mathfrak{s}})/(2p)\in\mathbb{N}}} \mathcal{T}_{(q_t-2p+2)/p}((-q_t+2p-2-d_t^{\mathfrak{s}})/(2p))^{\oplus n_t}.$$

Decomposition of $\mathrm{Fr}_* \mathcal{O}_{\mathrm{Gr}(2,n)}$

Corollary

Up to multiplicity, the indecomposable summands of $\mathrm{Fr}_* \mathcal{O}_{\mathbb{G}}$ *are*

1. $\mathcal{O}(-d)$, $d \in [0, n - \lceil n/p \rceil]$,
2. *for* $1 \leq j \leq n-3$, *if* $p \geq 1 + \lceil (j+1)/(n-2-j) \rceil$
$$\mathcal{T}_j(-d),\ d \in [j+1, (n-1) - \lceil (n-1)/p \rceil],$$
3. *for odd* $1 \leq j \leq n-3$, *if* $p > 2$
$$\begin{cases} \wedge^j \mathcal{R}(-d+1),\ d \in [(j+3)/2, (j+1+n)/2 - \lceil (n-1)/p \rceil] & \text{if } n \text{ even}, \\ \wedge^j \mathcal{R}(-d+1),\ d \in [(j+3)/2, (j+2+n)/2 - \lceil n/p \rceil] & \text{if } n \text{ odd}, \end{cases}$$
4. *for even* $1 \leq j \leq n-3$
$$\begin{cases} \wedge^j \mathcal{R}(-d+1),\ d \in [(j+2)/2, (j+2+n)/2 - \lceil n/p \rceil] & \text{if } n \text{ even}, \\ \wedge^j \mathcal{R}(-d+1),\ d \in [(j+2)/2, (j+1+n)/2 - \lceil (n-1)/p \rceil] & \text{if } n \text{ odd}. \end{cases}$$