

$M_{22}:2$ in characteristic 2

- $F[M_{22}:2]$ has only one block, i.e. the principal block B_1 of defect 8.
- $P \in \text{Syl}_2(M_{22}:2)$, $Q \in \text{Syl}_2(M_{22})$
- $N_{M_{22}:2}(P) = P = N_{M_{22}:2}(Q)$.
- The simple $F[M_{22}:2]$ -module $D(140)_{22:2}$ has vertex Q , the remaining simple modules have vertex P . Their Green correspondents and their sources, respectively, have the following Loewy structures:

module	$D(1)_{22:2}$	$D(10)_{22:2}$	$D(10)^*_{22:2}$	$D(34)_{22:2}$	$D(98)_{22:2}$
Green = source	1	10	10	34	98
layer dims.	1	1, 2, 1, 2, 1, 1, 1, 1	1, 1, 1, 2, 2, 1, 1, 1	2, 3, 3, 5, 4, 5, 4, 4, 2, 2	2, 5, 6, 9, 10, 12, 12, 12, 10, 8, 6, 3, 2, 1

module	$D(140)_{22:2}$
Green	140
layer dims.	1, 4, 7, 10, 13, 15, 17, 17, 15, 13, 11, 8, 5, 3, 1
source	70
layer dims.	1, 3, 4, 6, 7, 8, 9, 8, 7, 6, 5, 3, 2, 1

The simple $F[M_{22}:2]$ -modules have Brauer characters:

$$\begin{aligned}
 D(1)_{22:2} = F &\leftrightarrow \varphi_1, & D(10)_{22:2} &\leftrightarrow \varphi_2, & D(10)^*_{22:2} &\leftrightarrow \varphi_3, \\
 D(34)_{22:2} &\leftrightarrow \varphi_4, & D(98)_{22:2} &\leftrightarrow \varphi_7, & D(140)_{22:2} &\leftrightarrow \varphi_5.
 \end{aligned}$$