M_{23} in characteristic 2

- FM_{23} has three blocks: the principal block B_1 of defect 7, and two dual blocks of defect 0.
- $P \in \mathrm{Syl}_2(M_{23})$; $N_{M_{23}}(P) = P$
- All simple modules belonging to B_1 have vertex P, and the Loewy structures of their Green correspondents are as follows:

module	$D(1)_{23}$	$D(11)_{23}$	$D(11)^*_{23}$	$D(44)_{23}$	$D(44)^*_{23}$	$D(120)_{23}$
Green	1	11	11	44	44	56
layer dims.	1	$2,2,1,2,$ $1,1,1,1$	$1,1,1,2,$ $2,2,1,1$	$3,4,4,6,5,$ $6,5,5,3,2,1$	$2,3,4,5,5,$ $6,6,6,3,3,1$	$2,4,5,7,8,8,$ $7,6,4,2,2,1$

module	$D(220)_{23}$	$D(220)^*_{23}$	$D(252)_{23}$
Green	220	220	28
layer dims.	$3,8,12,18,22,26,27,$ $27,24,20,16,9,6,2$	$5,9,13,20,23,26,$ $28,27,22,18,14,8,5,2$	$3,4,4,5,$ $3,3,3,2,1$

- standard generators of M_{23}: $a := (1,19)(2,23)(3,15)(4,5)(8,16)(9,18)(12,17)(20,22)$, $b := (1,7,16,14)(2,4,6,19)(3,17,13,23)(5,21)(9,20)(10,12,18,11)$
- representative for conjugacy class $7A$: $(babababab babbbababababbabb)^3$

module	conj. class	modular char. value	Brauer char.
$D(11)^*_{23}$	$7A$	$0 = \overline{-b7}$	φ_2
$D(44)_{23}$	$7A$	$1 = \overline{-1+b7}$	φ_4
$D(220)^*_{23}$	$7A$	$0 = \overline{b7}$	φ_7

Hence:

$D(1)_{23} = F \leftrightarrow \varphi_1$, $D(11)_{23} \leftrightarrow \varphi_3$, $D(11)^*_{23} \leftrightarrow \varphi_2$, $D(44)_{23} \leftrightarrow \varphi_4$, $D(44)^*_{23} \leftrightarrow \varphi_5$, $D(120)_{23} \leftrightarrow \varphi_6$, $D(220)_{23} \leftrightarrow \varphi_8$, $D(220)^*_{23} \leftrightarrow \varphi_7$, $D(252)_{23} \leftrightarrow \varphi_9$.