With Vanessa Miemietz I have been computing various cohomology algebras associated with representations of $G = GL_2(F)$ where $F$ is the algebraic closure of the field with $p$ elements. I will describe our computation of the Yoneda extension algebra

$$\bigoplus_{i \in \mathbb{Z}, w, w' \in \mathcal{W}} \text{Ext}_{\mathcal{C}}^i(w, w'),$$

where $\mathcal{W} = \{ \text{Sym}^\lambda(V) \otimes \omega^\mu \mid \lambda \in \mathbb{Z}_{\geq 0}, \mu \in \mathbb{Z} \}$ is the set of Weyl modules for $G$. Here $V$ denotes the natural two dimensional representation of $G$, $\text{Sym}^\lambda(V)$ denotes the space of symmetric tensors of $V$ of degree $\lambda$ and $\omega$ denotes the determinant representation of $G$. 
