

## *CP* violation phase in BSM amplitudes

Firstly we define a *CP* violation phase  $\xi$  to quantify the mixture of *CP*-even and *CP*-odd states for Higgs boson in new physics beyond Standard Model.  
Then we show it explicitly in  $H \rightarrow \gamma\gamma$ ,  $H \rightarrow \gamma\ell\ell$  and  $H \rightarrow 4\ell$  amplitudes.  
The analytical form gives a good explanation why the *CP*-violation phase could be observed in  $H \rightarrow 4\ell$  process but not in  $H \rightarrow \gamma\gamma$  and  $H \rightarrow \gamma\ell\ell$  processes.  
Meanwhile, to study the relations of amplitudes, we find a new method of decomposing  $H \rightarrow \gamma\ell\ell$  and  $H \rightarrow 4\ell$  amplitudes into  $H \rightarrow \gamma\gamma$  amplitudes.  
For a comparison, by using the on-shell approach we study the recursion relations of amplitudes and get a consistent result independently.

### Presentation type

Oral

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