



Radiative decays of the $\chi_{c1}(3872)$

mini-workshop LHCb meets Theory

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X(3872): early years



- Discovered by Belle in 2003 in $J/\psi\pi\pi$ spectrum
- Surprisingly narrow for conventional charmonia with such mass
- Mass ~~Close~~ Equal to D^0D^{*0} mass threshold
- Copiously produced in hadron-hadron collisions
- $\pi\pi$ mass spectrum consistent with ρ^0
- hints for $J/\psi\omega$ decays



- Quantum numbers: 1^{++}
- Mass just below D^0D^{*0} mass
- Differential distributions in hadron-hadron collisions
- Small, but not-vanishing widths
- Observation of ω in $J/\psi\pi\pi$
- Attempts to probe the line shape
- ... ???



- A lot of experimental data
 - Main players today: BESIII, Belle II and LHCb
 - Sometime precision is rather poor and improvement are needed
 - Sometime combined analyses can be very helpful
- Interpretation is still unclear.

Today, let's concentrate on $\mathcal{R}_{\psi\gamma}$

$$\mathcal{R}_{\psi\gamma} \equiv \frac{\Gamma_{\chi_{c1}(3872) \rightarrow \psi(2S)\gamma}}{\Gamma_{\chi_{c1}(3872) \rightarrow J/\psi\gamma}}$$

"Diagnostic decay" proposed in 2004 by E.Swanson