

The $B \rightarrow \pi \ell \nu$ MC

A Tale of Form Factors

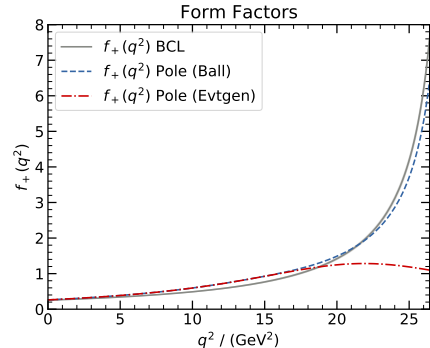
Markus Prim | 16th March 2018

INSTITUT FÜR EXPERIMENTELLE TEILCHENPHYSIK (ETP)



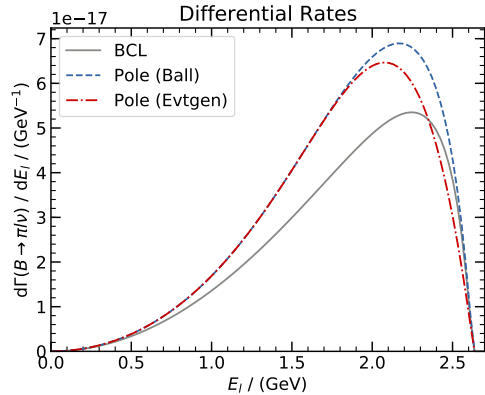
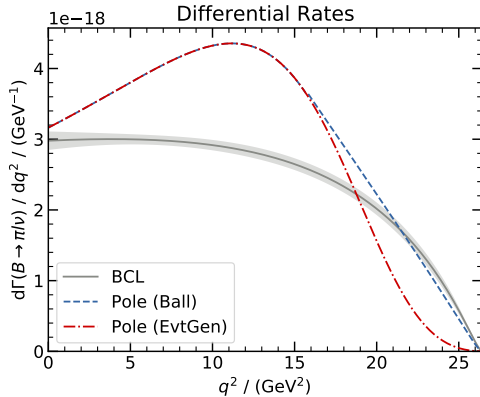
$B \rightarrow \pi \nu$ Form Factors

- Form factors describe the hadronic transition from $B \rightarrow \pi$
- $\langle B(p) | V_\mu - A_\mu | \pi(p') \rangle = (p + p')_\mu f_+(q^2)$,
with $q^2 = (p - p')^2$
- The implementation in Belle's EvtGen is based on:
P. Ball and R. Zwicky, J. High Energy Phys. 10 (2001) 019.
- The implementation is flawed



$B \rightarrow \pi \nu$ Form Factors

Consequences in the differential rates:



Take Home Message

- The $B \rightarrow ul\nu$ MC (aka SpecialMC2010) has to be used with caution.
- New $B \rightarrow \pi l\nu$ MC is currently produced and will be circulated.
- The $B \rightarrow \rho l\nu$ decay uses the same model and will also be investigated.