Isospin Symmetry in BToDlnu Decays

1. Isospin symmetry

From isospin symmetry, decay rates are same for

$$\Gamma(B^+ \to D\ell\nu) = \Gamma(B^0 \to D\ell\nu)$$
$$\Gamma(B^+ \to D^*\ell\nu) = \Gamma(B^0 \to D^*\ell\nu)$$

2. Branching fractions

Branching fractions are not same because of the difference in total rate or life time of B^+ and B^0

$$\frac{\tau_{B^+}}{\tau_{B^0}} = 1.086 \pm 0.017 = \frac{\Gamma_{B^0}}{\Gamma_{B^+}}$$

So,

$$\frac{BF(B^+ \to D^*\ell\nu)}{BF(B^0 \to D^*\ell\nu)} = \frac{\Gamma(B^+ \to D^*\ell\nu)}{\Gamma(B^0 \to D^*\ell\nu)}\frac{\Gamma_{B^0}}{\Gamma_{B^+}} = 1.086$$