

**Lemma 11.18** Let  $(\mathbf{X}', \mathbf{Y}')$  be  $n$  i.i.d. copies of a pair of generic random variables  $(X', Y')$ , where  $X'$  and  $Y'$  are independent and have the same marginal distributions as  $X$  and  $Y$ , respectively. Then

$$\Pr\{(\mathbf{X}', \mathbf{Y}') \in \Psi_{[XY]\delta}^n\} \leq 2^{-n(I(X;Y) - \delta)}.$$