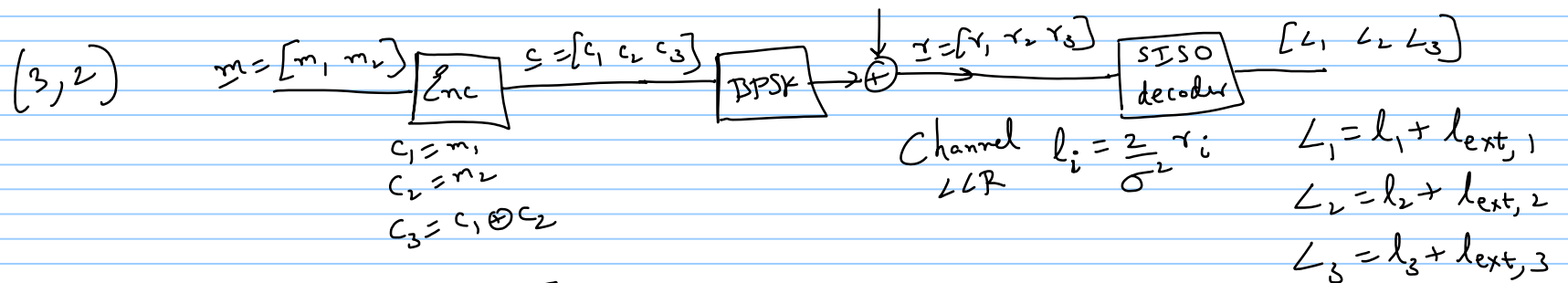


Single Parity-check code (SPC)



$$f(x) = \left| \log \tanh\left(\frac{|x|}{2}\right) \right|$$

$$\text{sgn}(l_{ext,1}) = \text{sgn}(l_2) \text{sgn}(l_3)$$

$$|l_{ext,1}| = f(f(l_2) + f(l_3))$$

$$f(l_2) + f(l_3) \approx f(\min(|l_2|, |l_3|))$$

$$|l_{ext,1}| \approx f(f(\min(|l_2|, |l_3|)))$$

$$= \min(|l_2|, |l_3|)$$

Minsum approximation