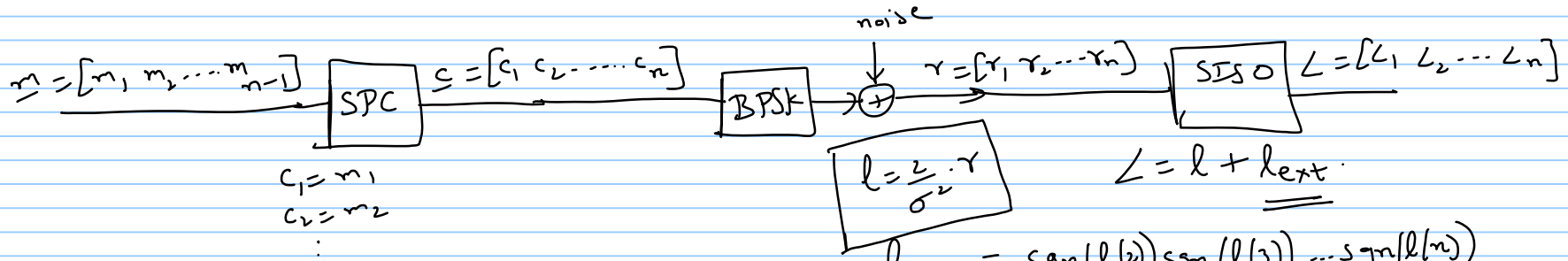
SPC code: $(n, n-1)$



$c_1 = m_1$
$c_2 = m_2$
$\vdots$
$c_{n-1} = m_{n-1}$
$c_n = c_1 \oplus c_2 \oplus \cdots \oplus c_{n-1}$

$L = l + l_{ext}$

$$l_{ext,1} = \operatorname{sgn}(l(2))\operatorname{sgn}(l(3)) \cdots \operatorname{sgn}(l(n)) \min\left(|l(2)|, |l(3)|, \ldots, |l(n)|\right)$$

$$l_{ext,2} = \operatorname{sgn}(l(1))\operatorname{sgn}(l(3)) \cdots \operatorname{sgn}(l(n)) \min\left(|l(1)|, |l(3)|, \ldots, |l(n)|\right)$$

$\vdots$

$$l_{ext,n} = \operatorname{sgn}(l(1))\operatorname{sgn}(l(2)) \cdots \operatorname{sgn}(l(n-1)) \min\left(|l(1)|, |l(2)|, \ldots, |l(n-1)|\right)$$

$$c_n = c_1 \oplus c_2 \oplus c_3 \oplus c_4 \oplus \cdots \oplus c_{n-1}$$

$$\min\left(\min\left(|l(1)|, |l(2)|\right), |l(3)|\right) = \min\left(|l(1)|, |l(2)|, |l(3)|\right)$$

$$S = \operatorname{sgn}(l(1))\operatorname{sgn}(l(2))\operatorname{sgn}(l(3)) \cdots \operatorname{sgn}(l(n))$$

$$\operatorname{sgn}(l_{ext,1}) = S\ \operatorname{sgn}(l(1))$$
$$\operatorname{sgn}(l_{ext,2}) = S\ \operatorname{sgn}(l(2))$$
$\vdots$
$$\operatorname{sgn}(l_{ext,n}) = S\ \operatorname{sgn}(l(n))$$

$S = +1$ (or) -1

$\operatorname{sgn}(l_{ext,i}) = \operatorname{sgn}(l(i))$

$\operatorname{sgn}(l_{ext,i}) = -\operatorname{sgn}(l(i))$

$$m_1 = \min\left(|\ell(1)|, |\ell(2)|, \ldots, |\ell(n)|\right)$$ overall minimum

$$pos = \arg\min\left(|\ell(1)|, |\ell(2)|, \ldots, |\ell(n)|\right)$$

where does minimum occur?

$$\boxed{m_1 = |\ell(pos)|}$$

$$m_2 = \min\left(|\ell(1)|, |\ell(2)|, \ldots, |\ell(pos-1)|, |\ell(pos+1)|, \ldots, |\ell(n)|\right)$$

overall second minimum

$$|\ell_{ext,pos}| = m_2$$

$$|\ell_{ext,i}| = m_1 \quad i \neq pos$$