Receiving the Top Coordinate (Contd.)

23

$$\leq \exp\left(-s^{p-2}\log^3 n \cdot \frac{\mathbf{e}_{i^*}^{-1}\left(\sum_j x_{i^*}(j)^{p/2}\right)^2}{\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p}\right)$$

$$\left(\sum_j x_{i*}(j)^{p/2} \right)^2 \geq \frac{1}{s^{p-2}} \left(\sum_j x_{i*}(j) \right)^p = \frac{1}{s^{p-2}} \left(x_{i*} \right)^p$$

$$\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p \leq \sum_i \mathbf{e}_i^{-1} x_i^p \leq (C \log^2 n) \cdot \mathbf{e}_{i^*}^{-1} x_{i^*}^p$$

$$\Pr[\text{Not receiving } i^*] \leq 1/\text{poly}(n)$$

$$(c_f[S] = S^{p-1})$$

Super-additivity of $f(y) = y^p$

largeness of $\mathbf{e}_{i^*}^{-1} x_{i^*}^p$

Receiving the Top Coordinate (Contd.)

$$\leq \exp\left(-s^{p-2}\log^3 n \cdot \frac{\mathbf{e}_{i*}^{-1}\left(\sum_j x_{i*}(j)^{p/2}\right)^2}{\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p}\right)$$

$$\left(\sum_j x_{i*}(j)^{p/2}\right)^2 \geq \frac{1}{s^{p-2}}\left(\sum_j x_{i*}(j)\right)^p = \frac{1}{s^{p-2}}\left(x_{i*}\right)^p \qquad (c_f[s] = s^{p-1})$$

$$\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p \leq \sum_i \mathbf{e}_i^{-1} x_i^p \leq (C\log^2 n) \cdot \mathbf{e}_{i*}^{-1} x_{i*}^p$$

Super-additivity of $f(y) = y^p$

largeness of $\mathbf{e}_{i*}^{-1} x_{i*}^p$

Pr[Not receiving $i*$] $\leq 1/$poly(n)

Computing i^*