Receiving the Top Coordinate (Contd.)

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

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

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

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

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

(Super-additivity)

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)

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

Computing i^*