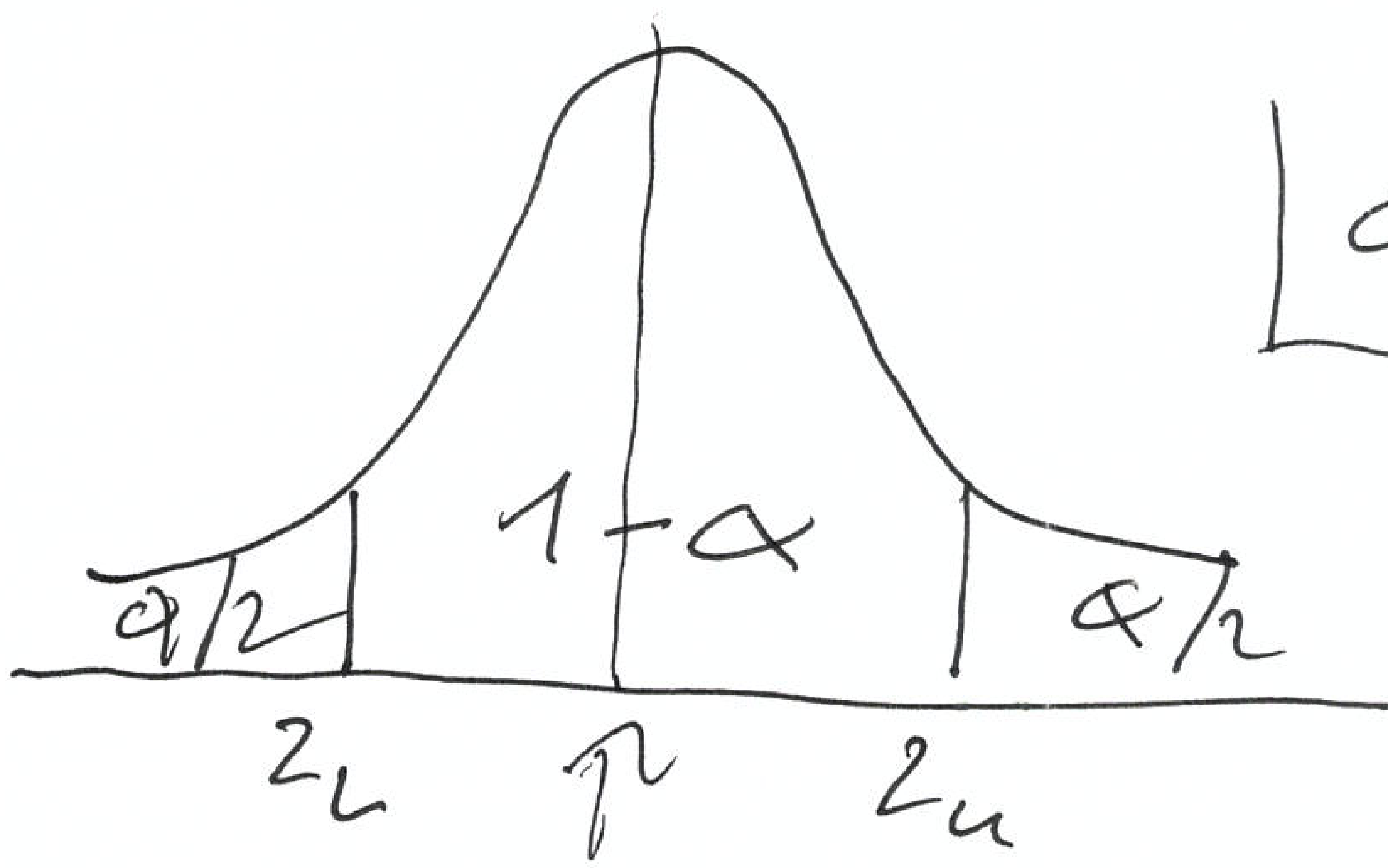
UN I.C ha le struttura $[L; U]$

$$L = M_n + z_L \frac{\sigma}{\sqrt{n}}$$

$$U = M_n + z_u \frac{\sigma}{\sqrt{n}}$$

$$z_u = z_{1-\alpha/2} > 0; \quad z_L = z_{\alpha/2} = -z_{1-\alpha/2} < 0$$

$$\Phi(z_u) - \Phi(z_L) = 1 - \alpha$$



$\boxed{\alpha < 0.5}$

Probabilità sovrastimo p

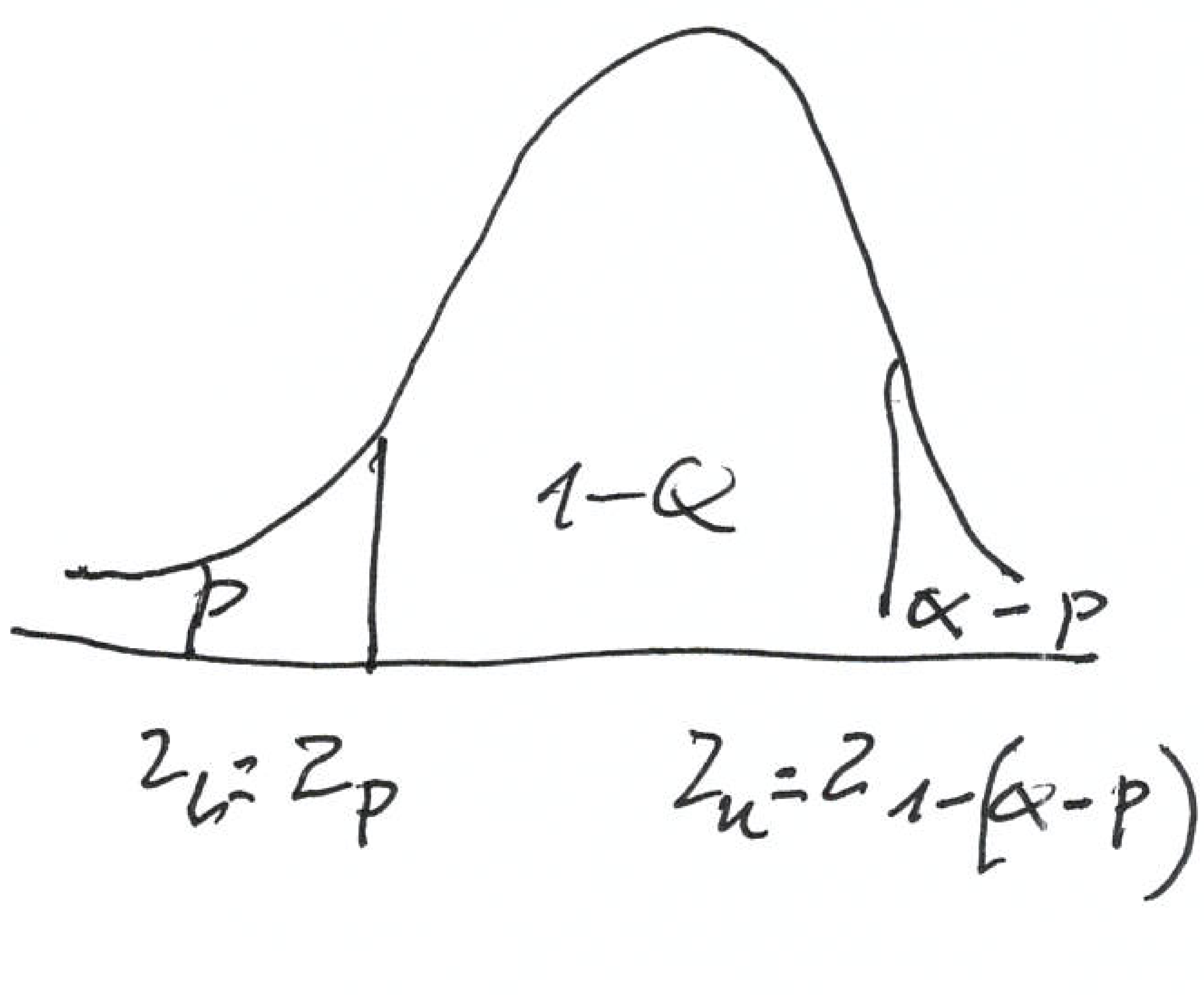
$$p = P\left(\mu < \mu_n + z_\ell \frac{\sigma}{\sqrt{n}}\right) =$$

$$= P\left(\frac{\mu_n - \mu}{\sigma}\sqrt{n} > -z_\ell\right) = 1 - \Phi(-z_\ell) =$$

$$= \Phi(z_\ell) = \frac{\alpha}{2}$$

in generale posso chiedere

$p = \Phi(z_\ell)$ con $0 < p < \alpha$



$p = 0$ $\quad z_\ell = z_p = -\infty \qquad z_u = z_\alpha$

$p = \alpha$ $\quad z_{1-(\alpha-p)} = z_u = \infty \quad z_\ell = z_\alpha$

Probabilità sottostima

$$P\left(\mu > \mu_n + z_u \frac{\sigma}{\sqrt{n}}\right) =$$

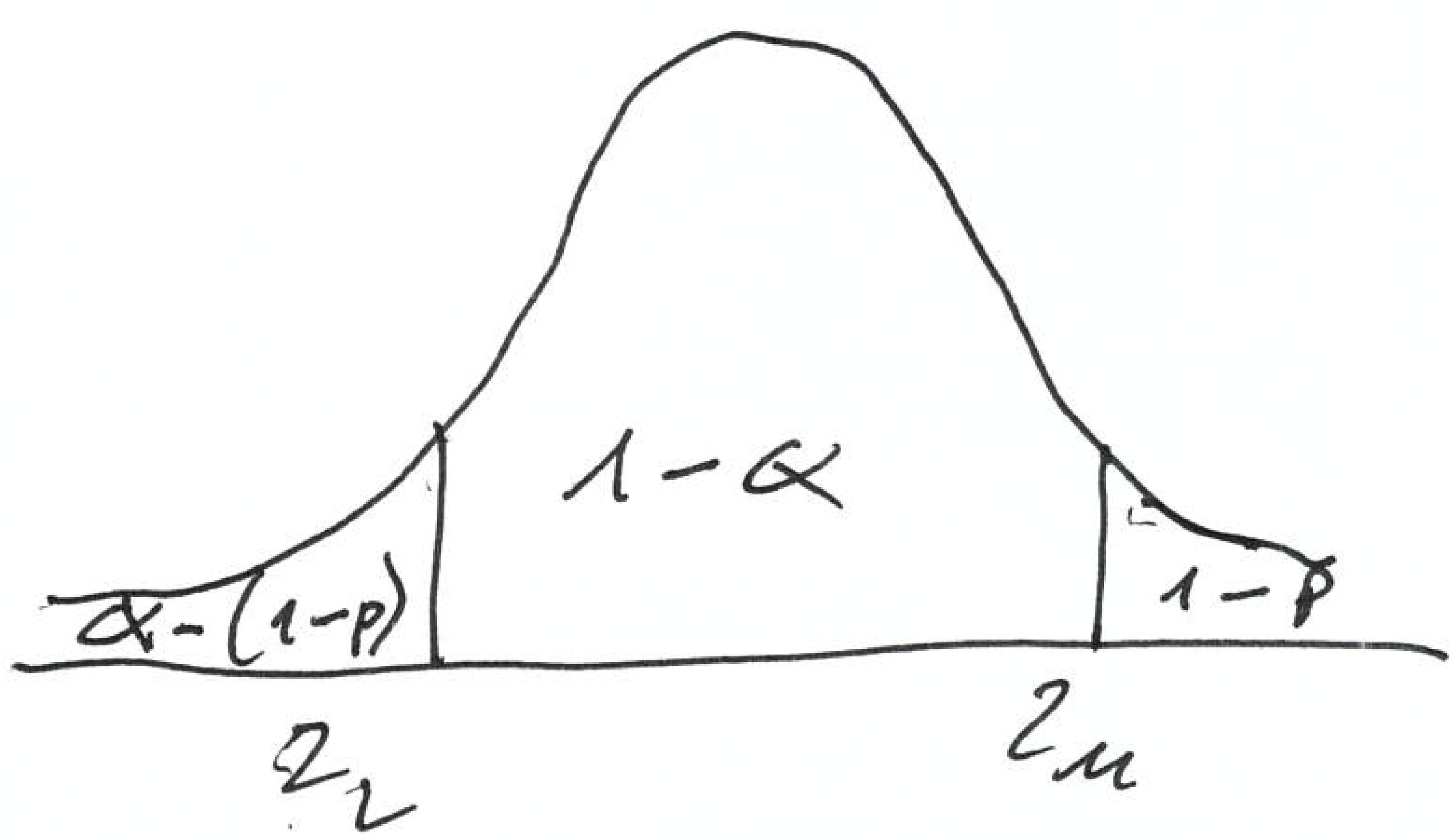
$$= P\left(\frac{\mu_n - \mu}{\sigma}\sqrt{n} < -z_\alpha\right) = \Phi(-z_\alpha)$$

$$= 1 - \Phi(z_u) = 1 - \left(1 - \frac{\alpha}{2}\right) = \frac{\alpha}{2}$$

In generale

$$1 - \Phi(z_u) = 1 - p$$

$$0 < 1 - p < \alpha$$



$$z_l = z_{\alpha-(1-p)}$$

$1-p=0 \quad z_u = \infty \quad z_l = z_\alpha$

$1-p=\alpha \quad z_l = -\infty \quad z_u = \alpha$