$$\left\{x : (y_\alpha - x)^2 < (y_\beta - x)^2\right\} \subset S_\alpha, \ \forall\ \beta \neq \alpha$$

$$\begin{array}{ccc}
(y_\alpha - x)^2 & < & (y_\beta - x)^2 \\
y_\alpha^2 + x^2 - 2y_\alpha x & < & y_\beta^2 + x^2 - 2y_\beta x \\
\frac{1}{2}y_\alpha^2 - y_\alpha x & < & \frac{1}{2}y_\beta^2 - y_\beta x \\
x(y_\beta - y_\alpha) - \frac{1}{2}\left(y_\beta^2 - y_\alpha^2\right) & < & 0 \\
(y_\beta - y_\alpha)\left(x - \frac{1}{2}(y_\beta + y_\alpha)\right) & < & 0
\end{array}$$

$$\left\{x : (y_\beta - y_\alpha)\left(x - \frac{1}{2}(y_\beta + y_\alpha)\right) < 0\right\} \subset S_\alpha, \ \forall\ \beta \neq \alpha$$