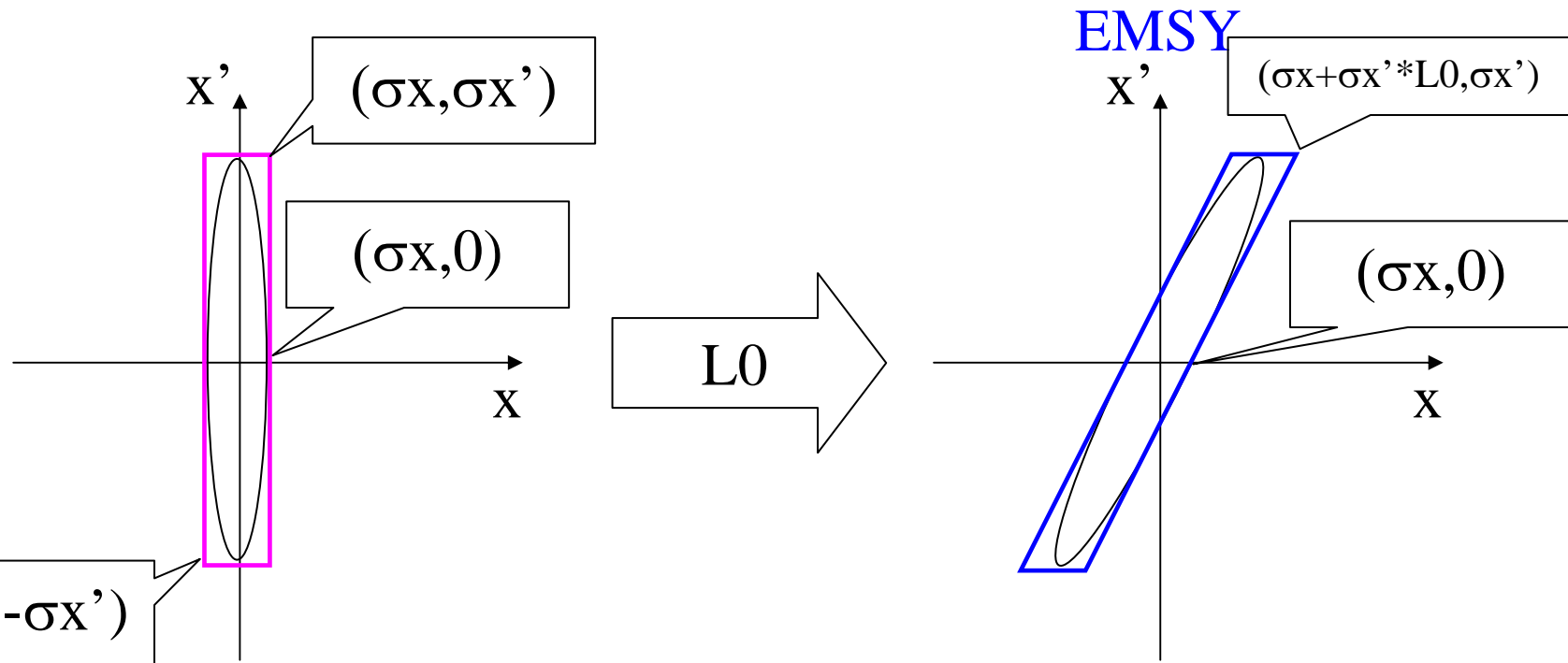


Emittance measurements using slit method for low emittance strong divergent beams

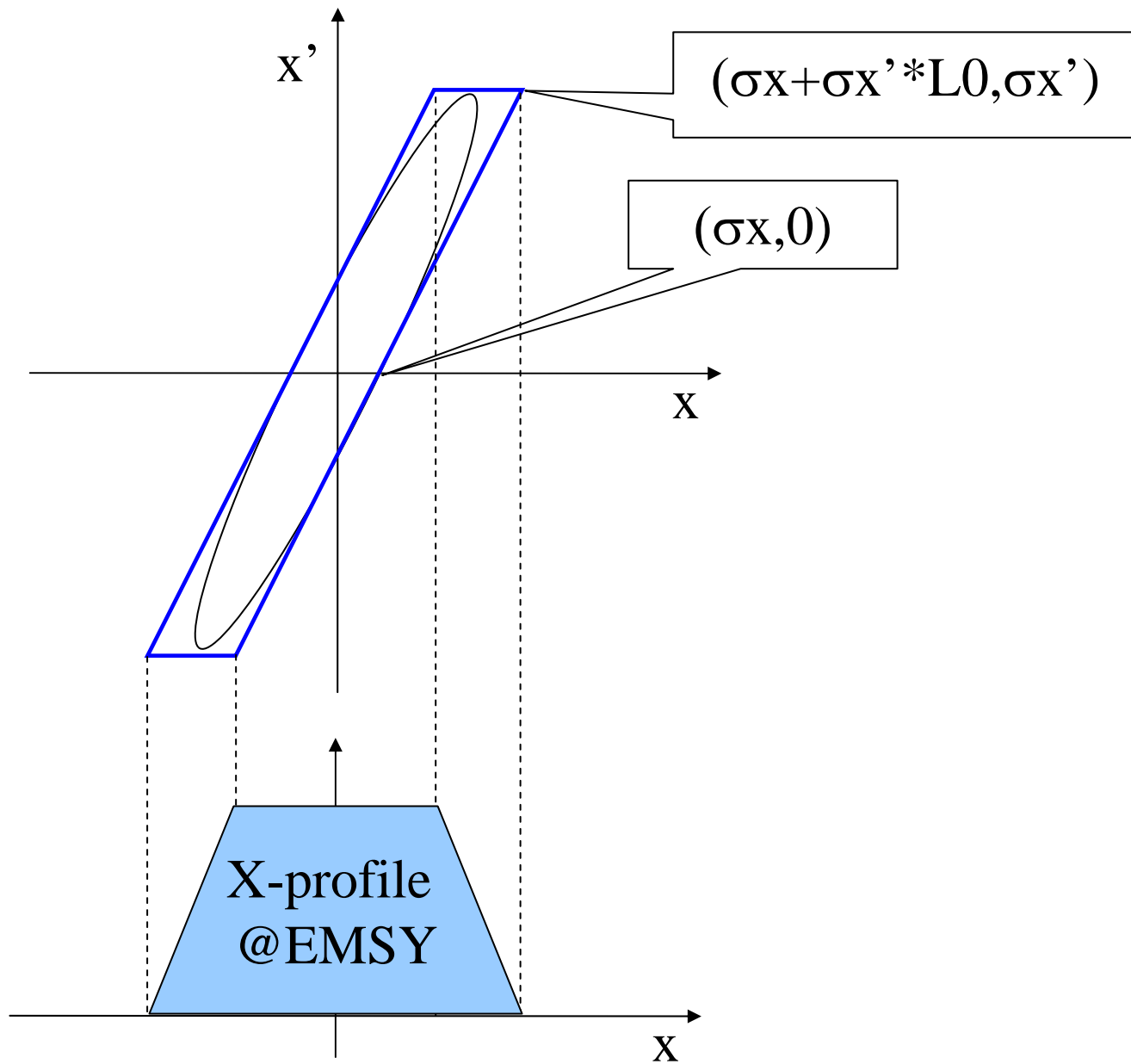
*M.Krasilnikov,
PPS, 27.07.2010*

Simplified approach

- Narrow slit (“zero-opening”)
- Phase space \rightarrow ellipse \rightarrow parallelogram
- Drift space after the waist, no space charge
- Low emittance, small beam size, strong divergence

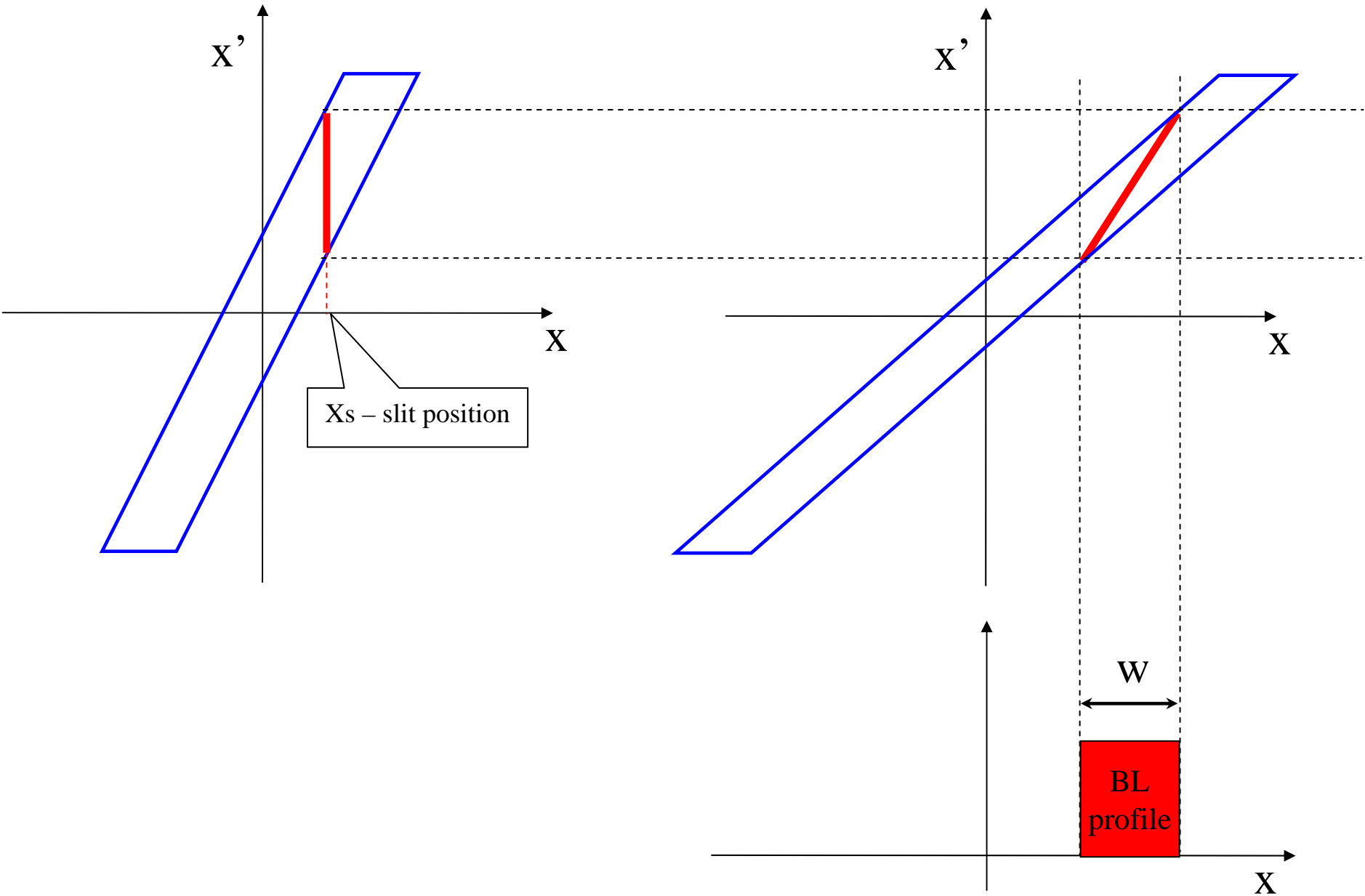


Beam at EMSY

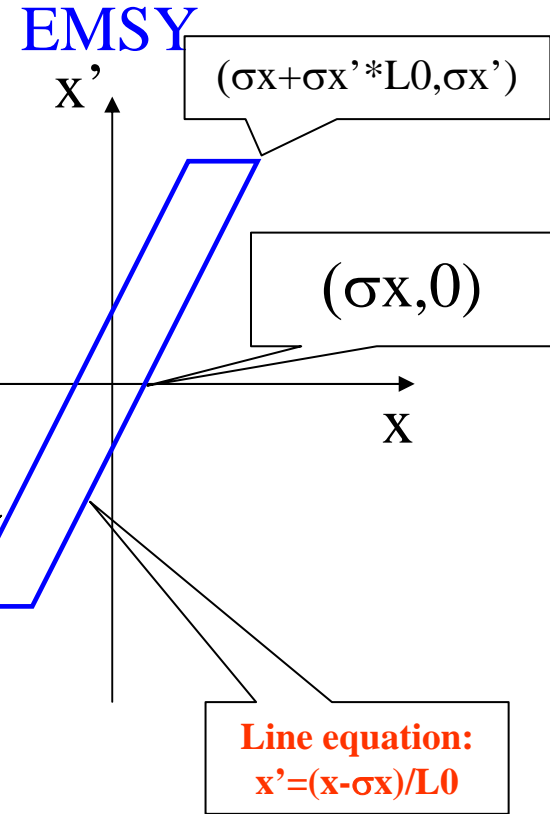
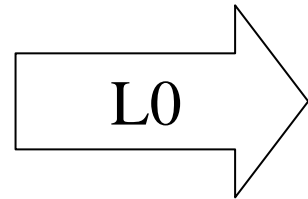
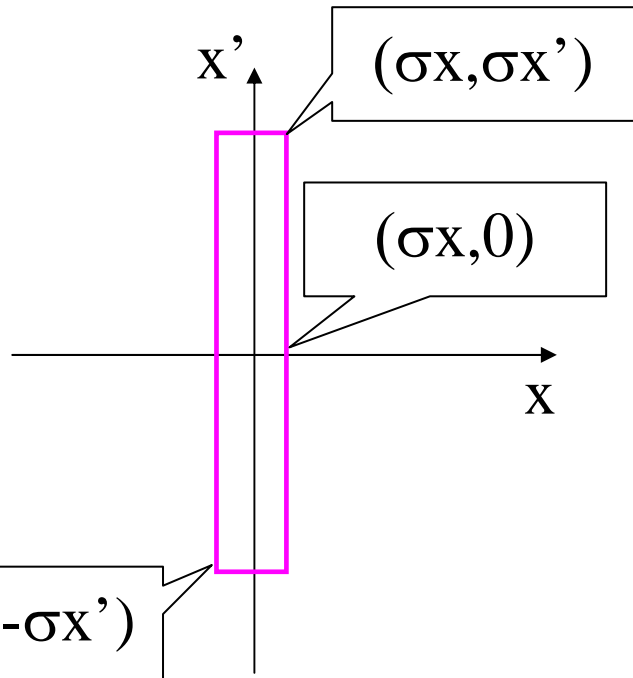


Beamlet at BL (collector) screen

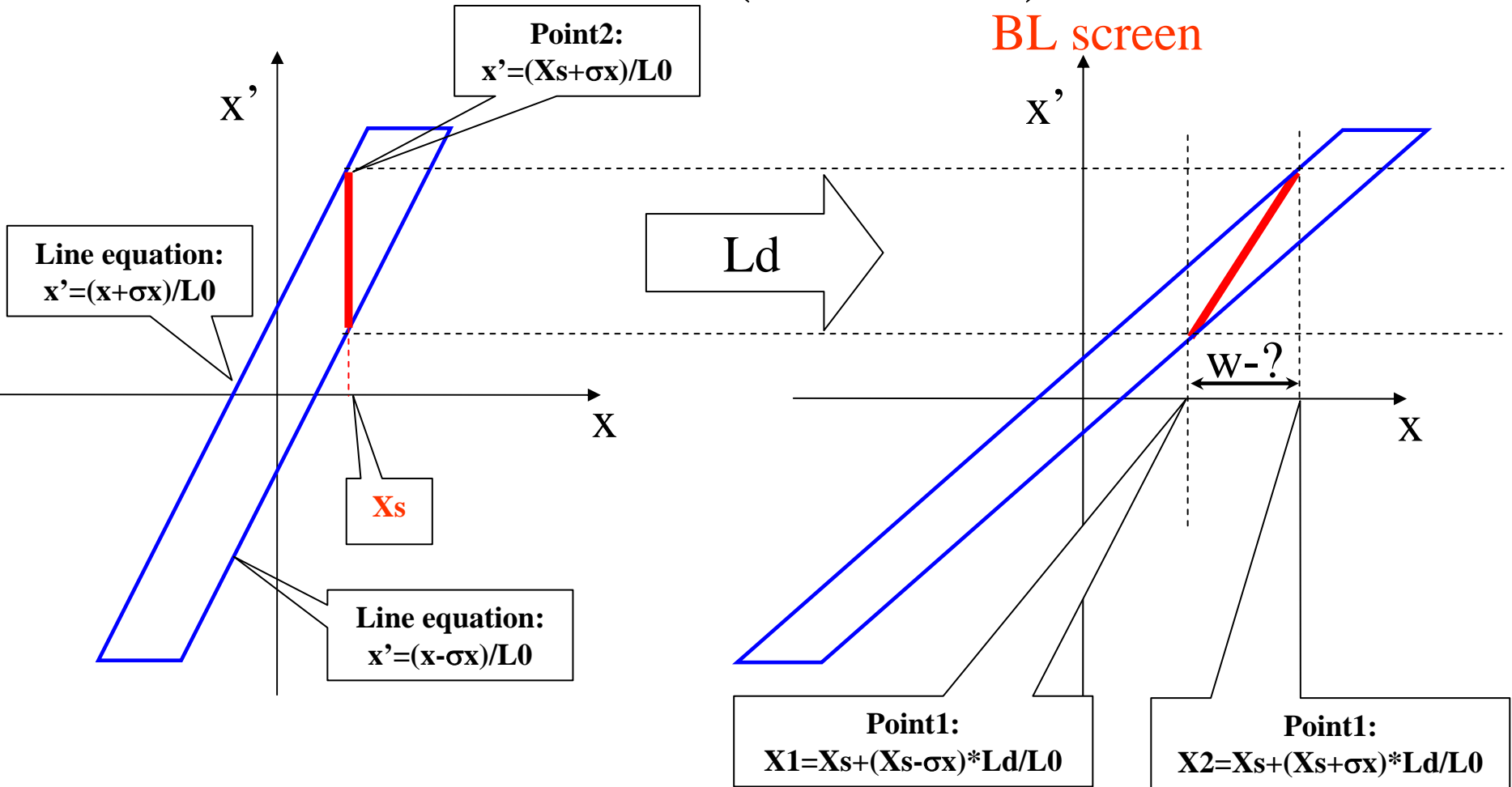
BL screen



Phase space at EMSY



Beamlet at BL (collector) screen



$$w = X_2 - X_1 = 2 * \sigma_x * L_d / L_0$$

Beamlet width from the beam core

Drift between EMSY and BL screen

$$w = 2 \cdot \sigma_x \cdot \frac{L_d}{L_0}$$

Drift from the waist to EMSY

whole beam size
at the waist

Beam divergence σ_x' has no effect on the width of the beamlets from the beam core!

? Impact on emittance measurements for low charge, esp. “thermal emittance measurements?”