

Contrôle no 1

vendredi 3 février 2006

Choisir deux éléments constitutifs d'une image et citer une application résultant de son analyse.

Question subsidiaire : quels outils mathématiques vous semblent utile à cette analyse ?

Durée : moins de 10 minutes





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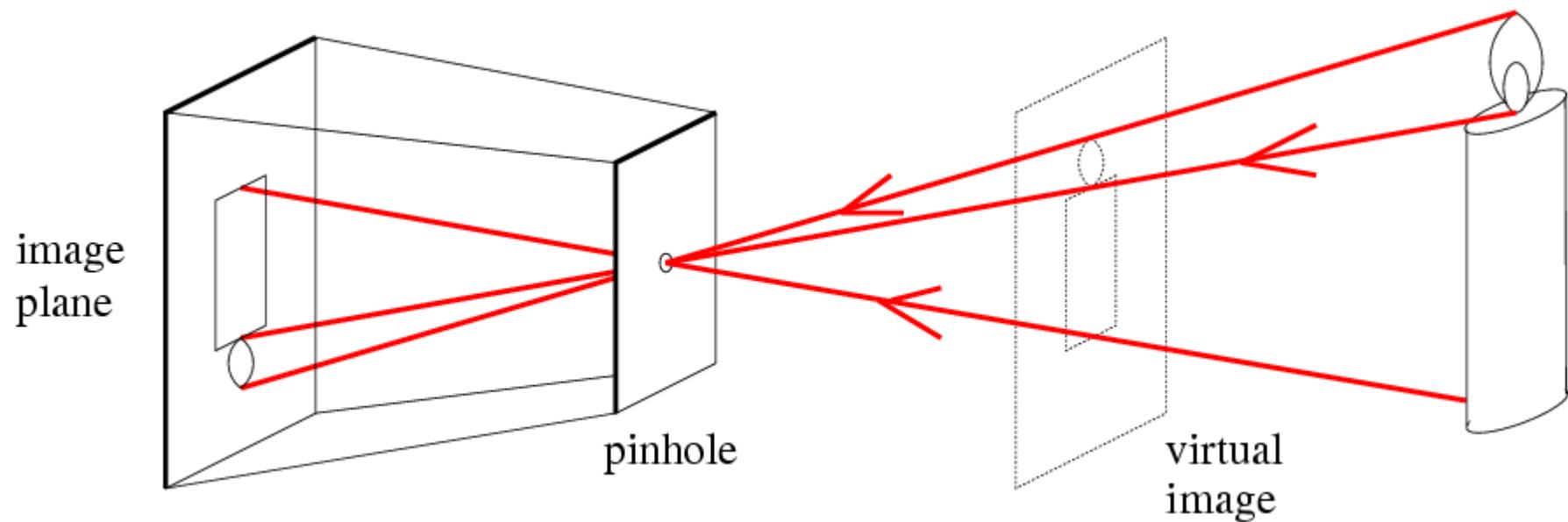
2. Caméras



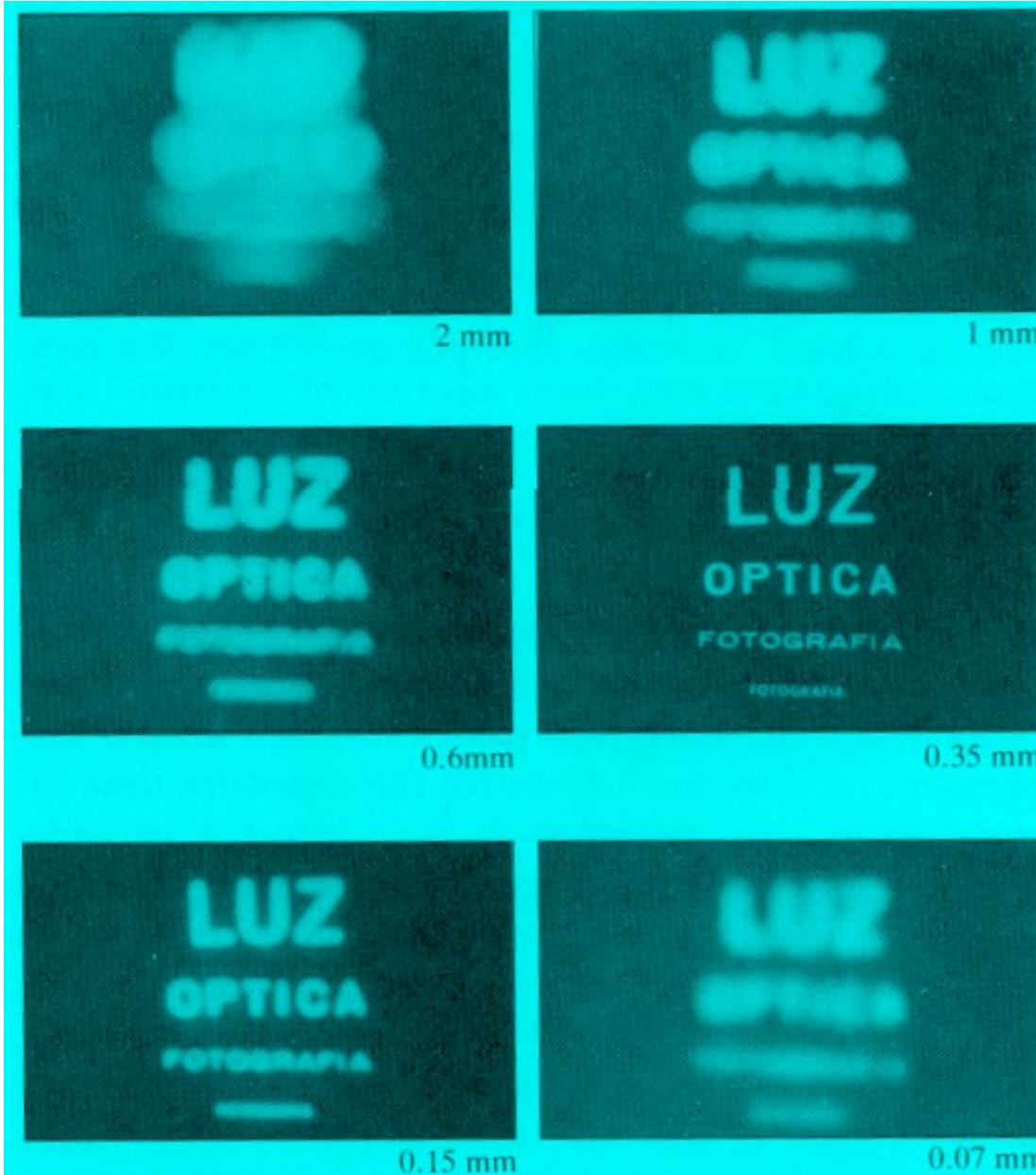
© ABELARDO MORELL

Camera obscura

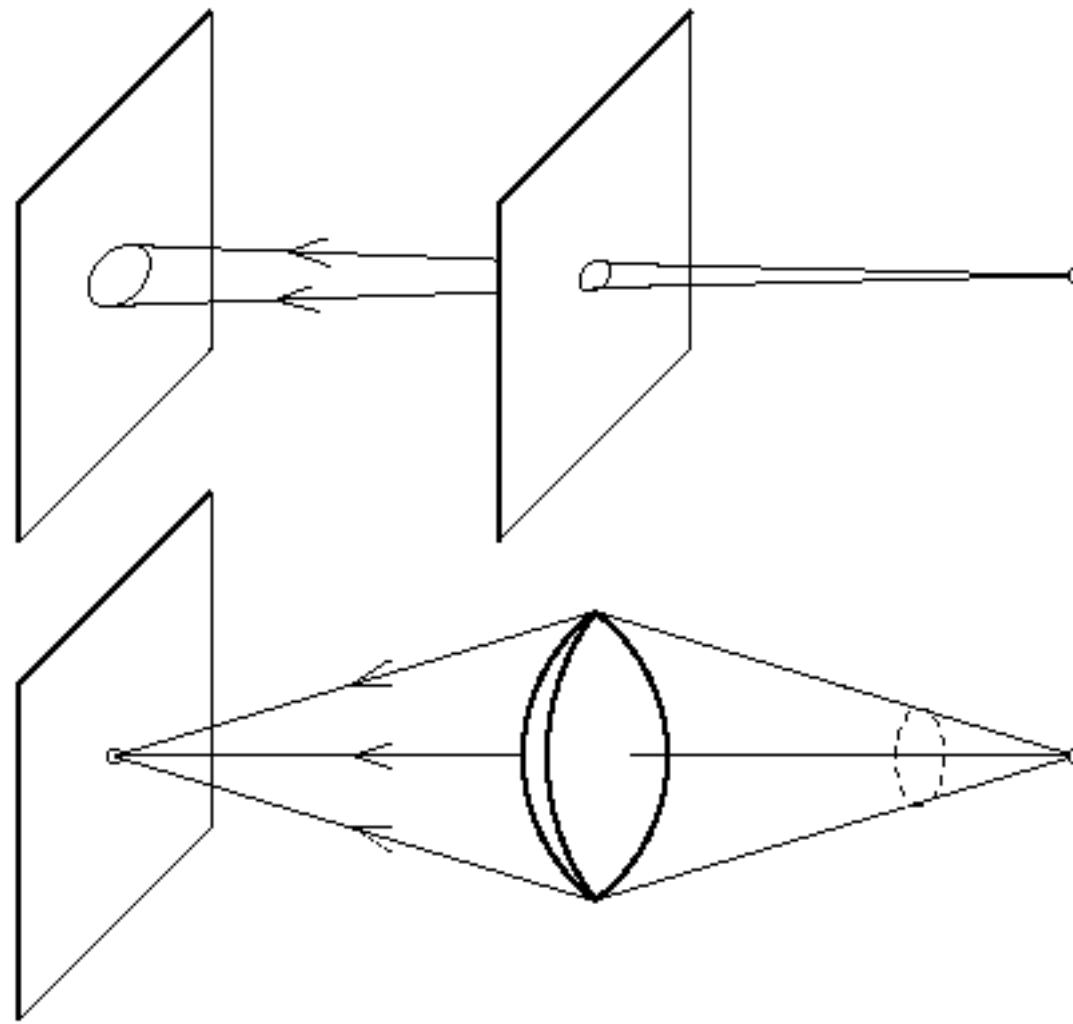
Camera obscura



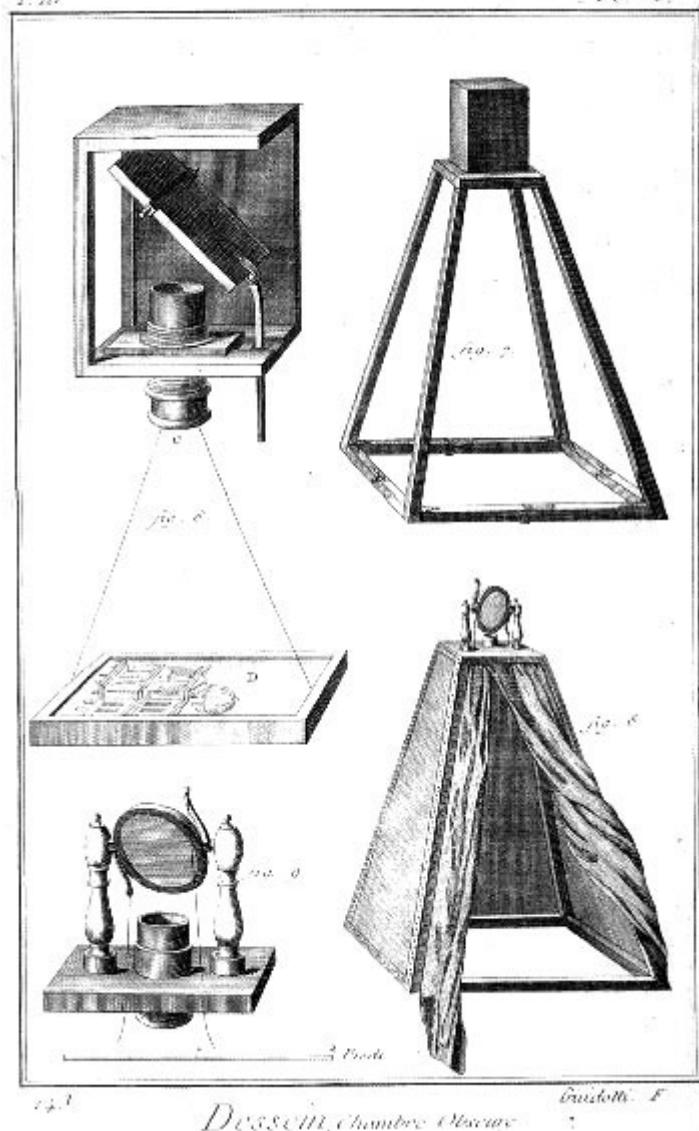




Flou ou diffraction
suivant la taille du trou de la camera



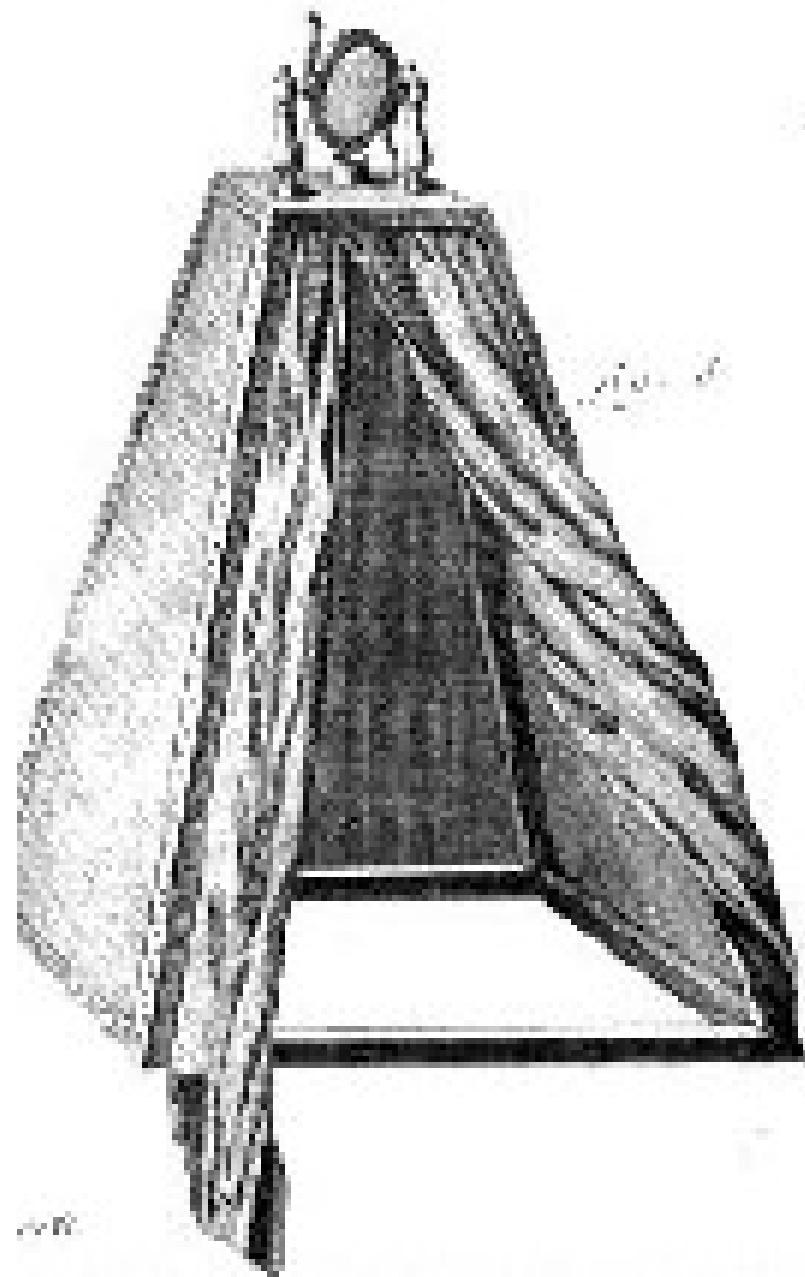
On a besoin d'une lentille !

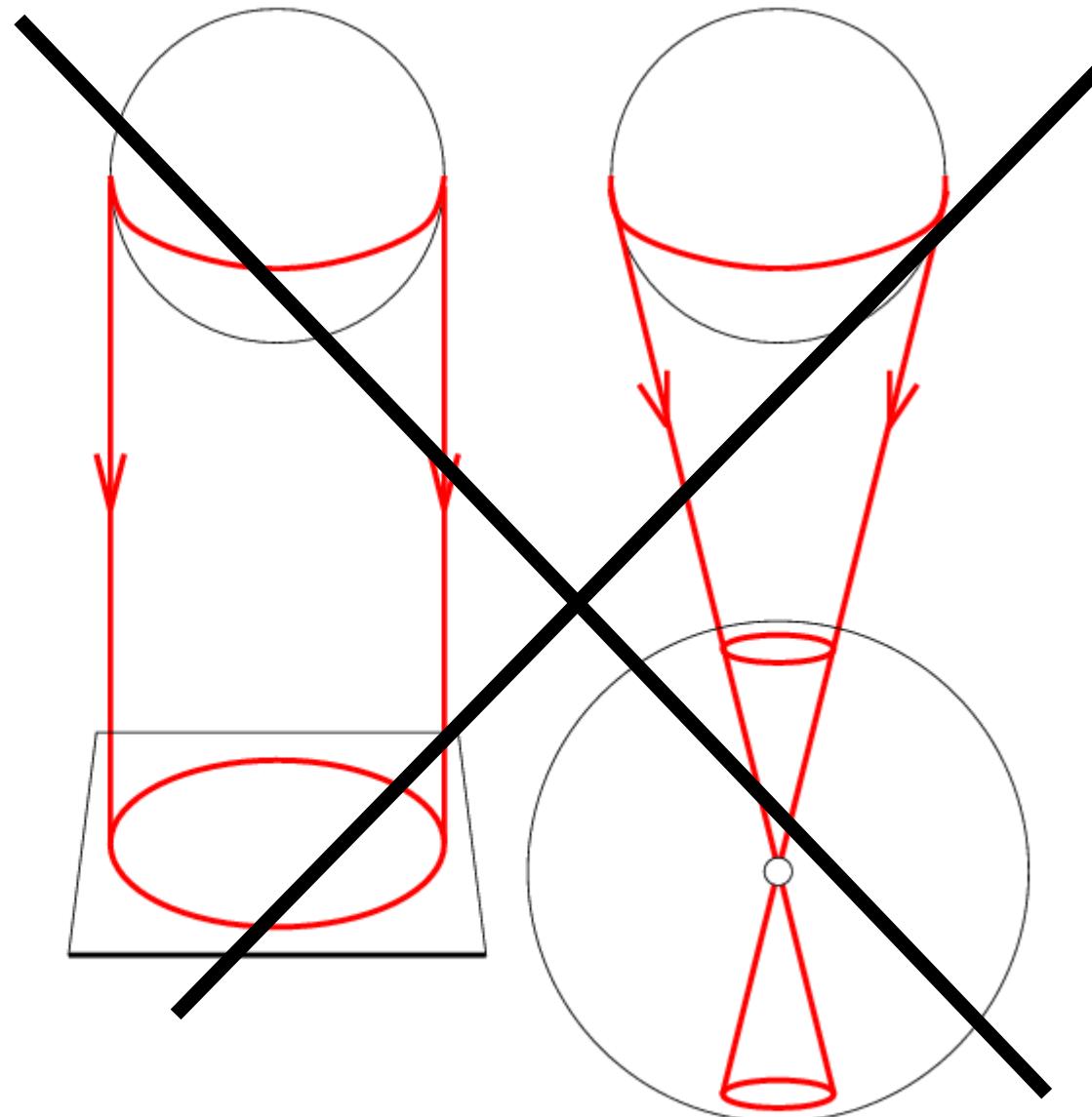
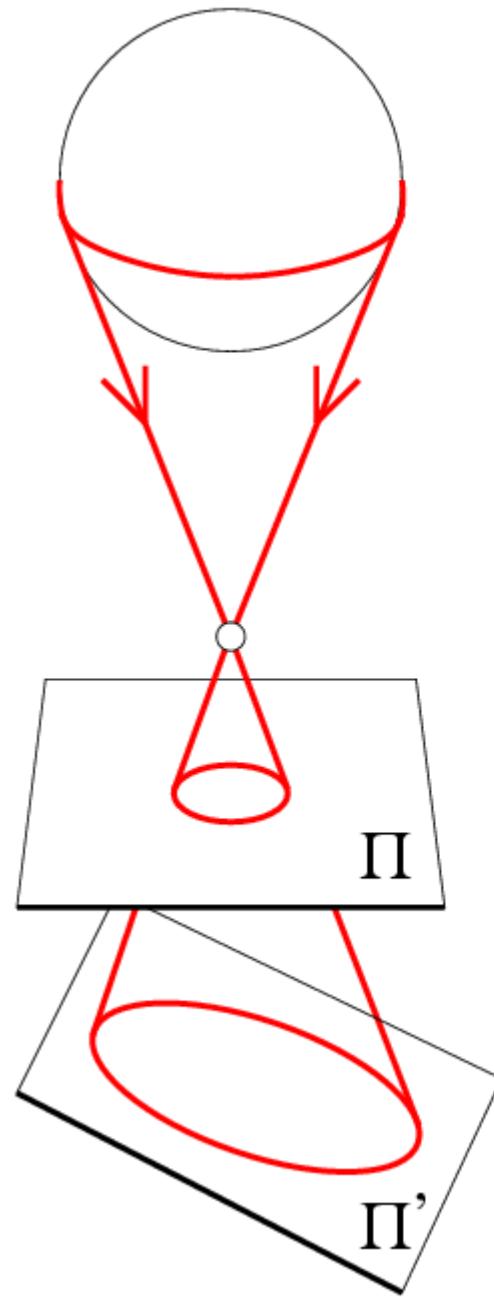


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Dessin, chambre Obscur

Guidotti. 8





Modèle géométrique de caméra

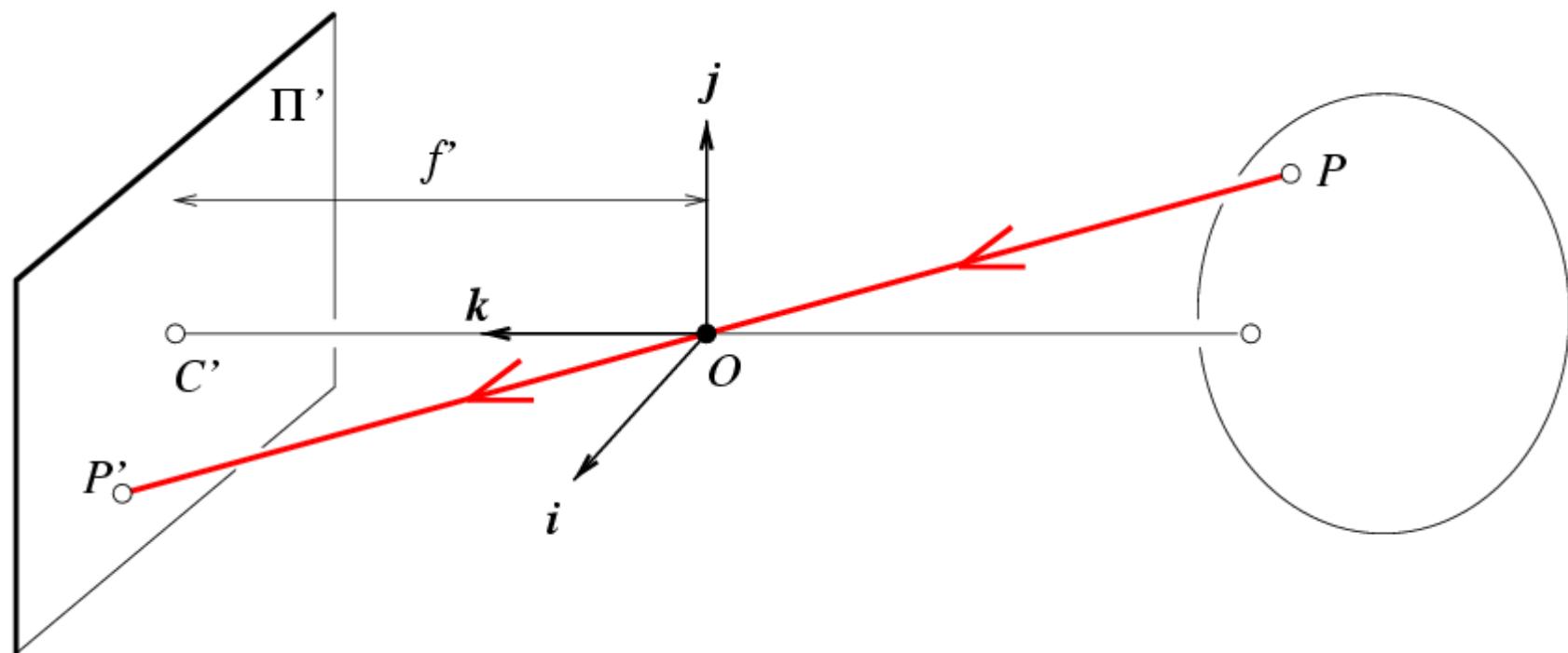


Image d'une scène plane

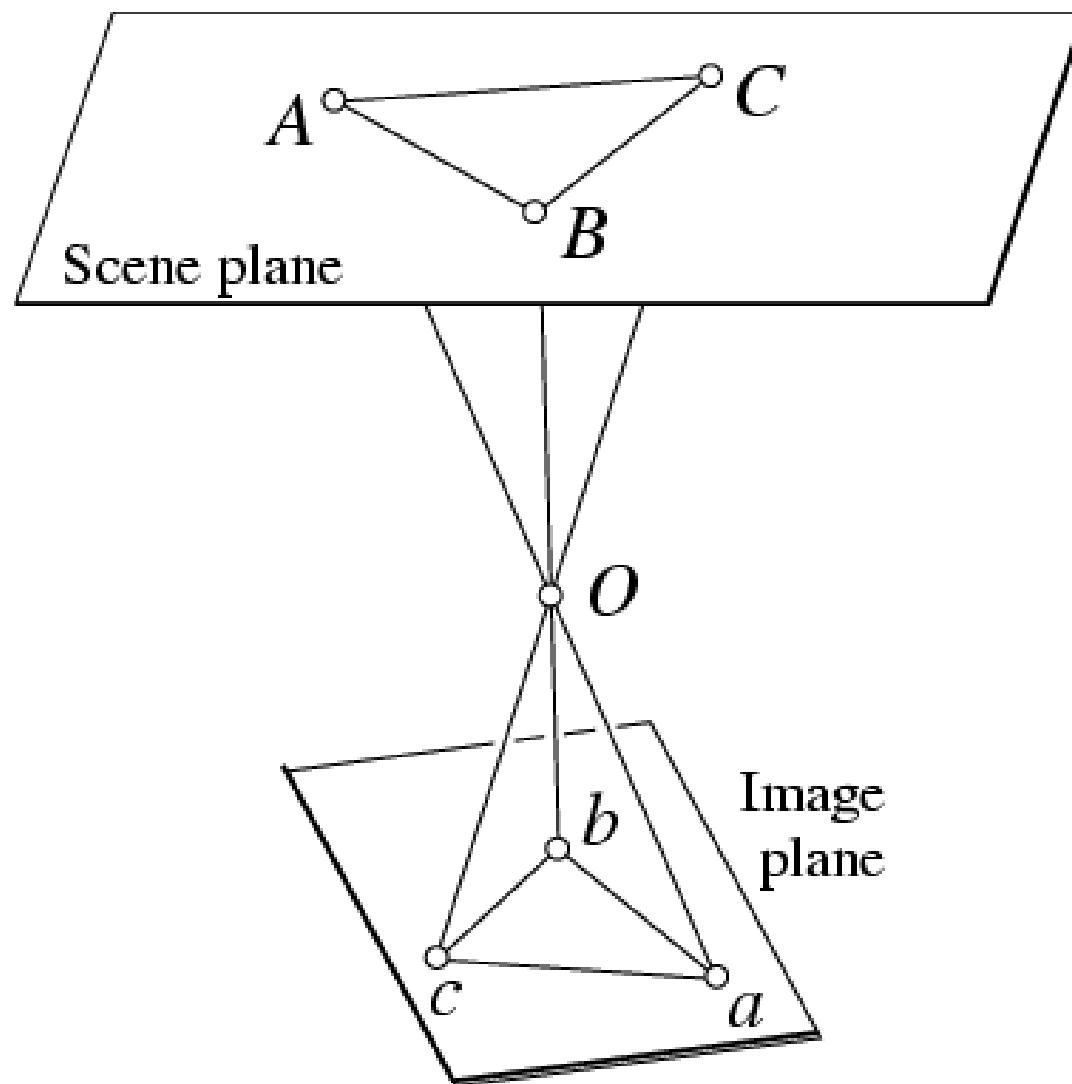
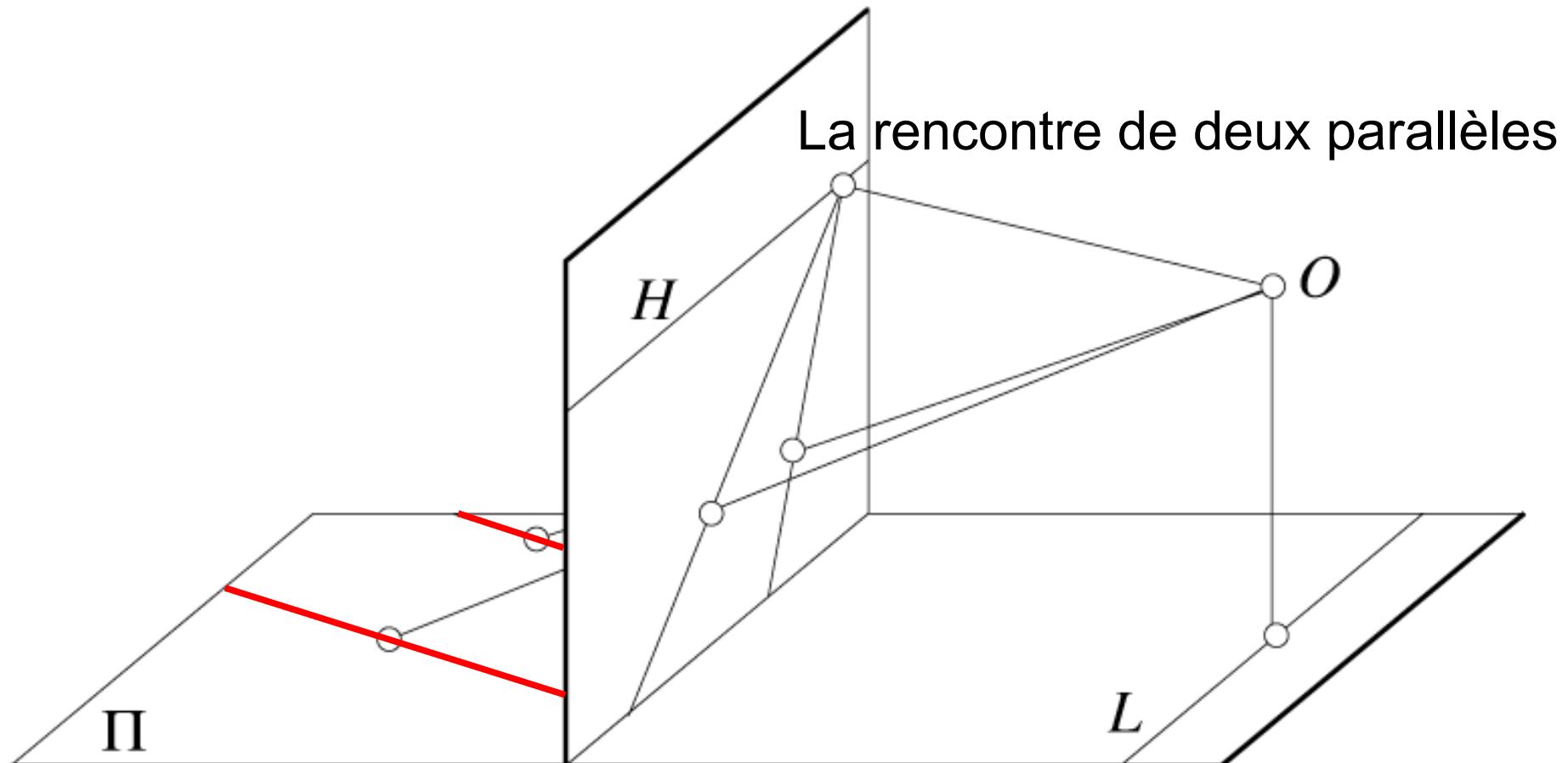
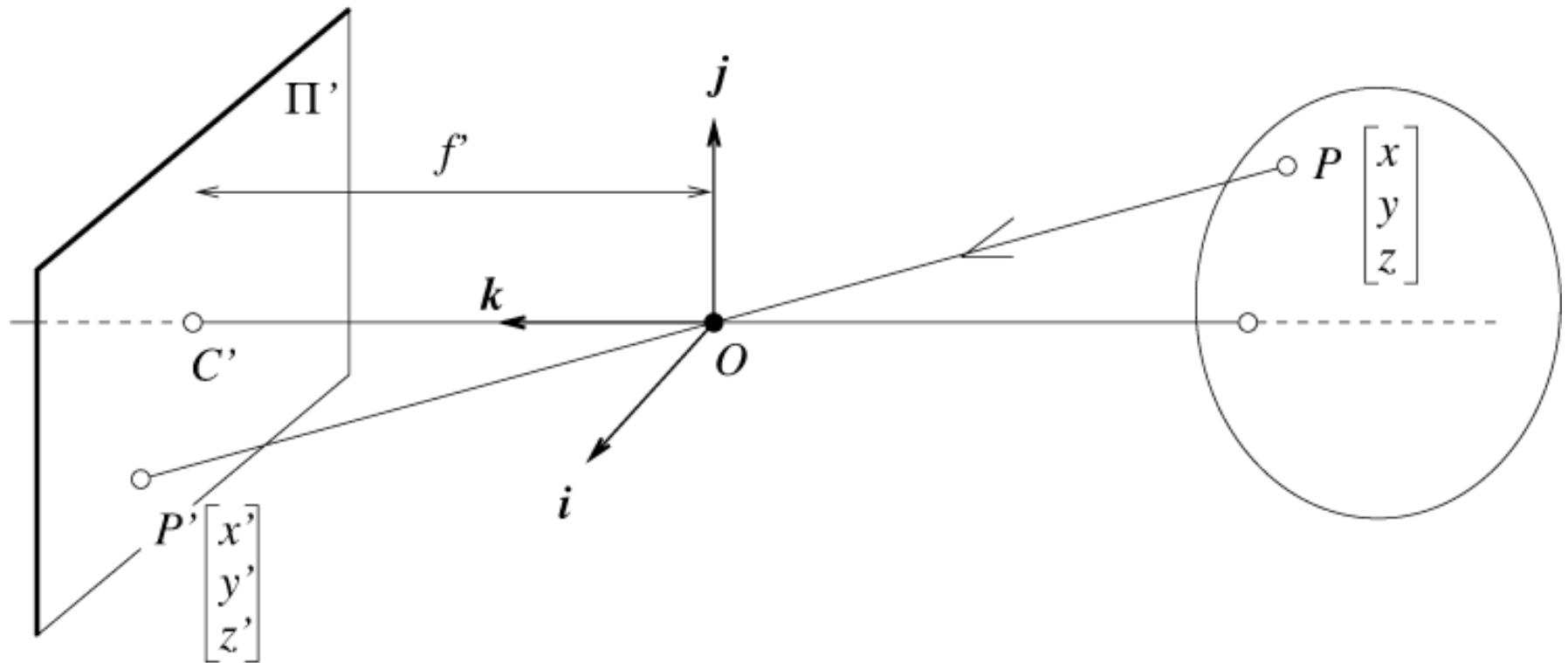
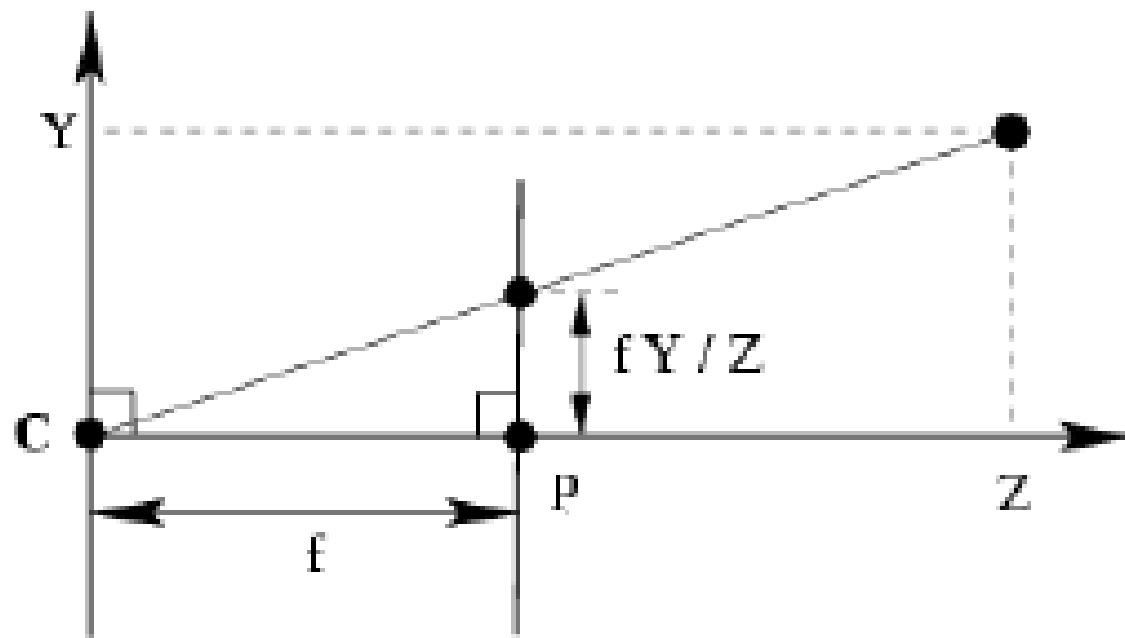
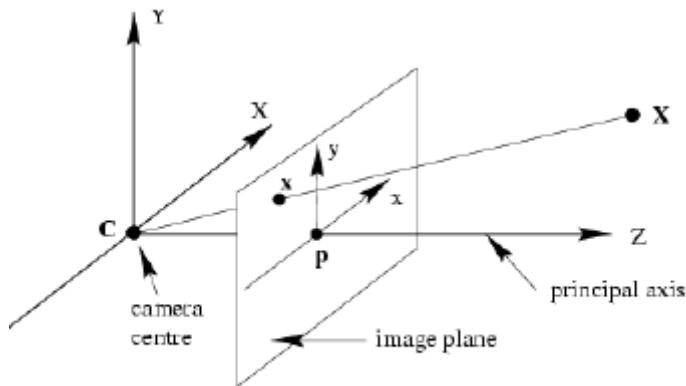


Image d'une scène plane





Exprimer les coordonnées de l'image
en appliquant une matrice



$$(X, Y, Z)^T \mapsto (fX/Z + p_x, fY/Z + p_y)^T$$

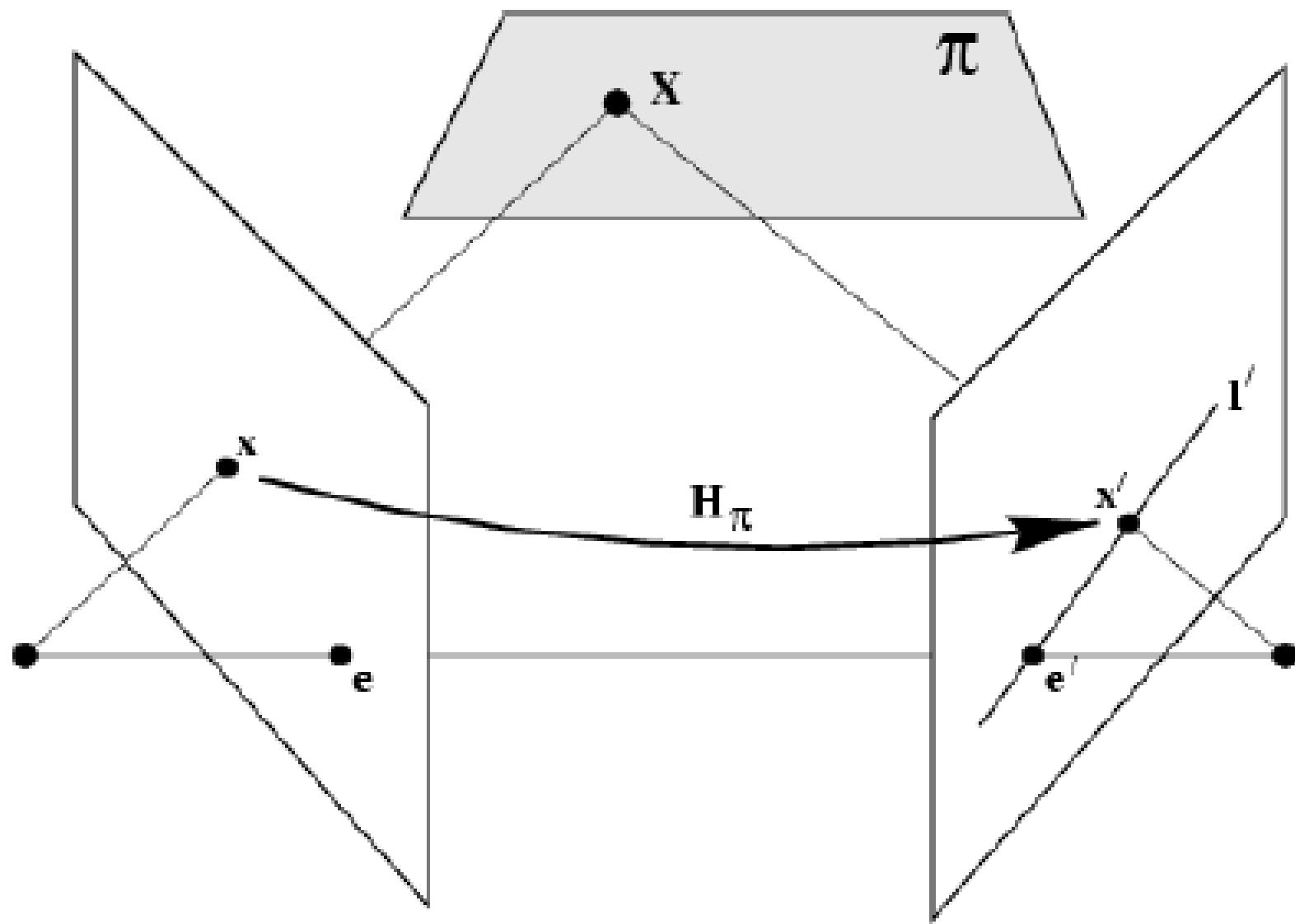
Coordonnées homogènes

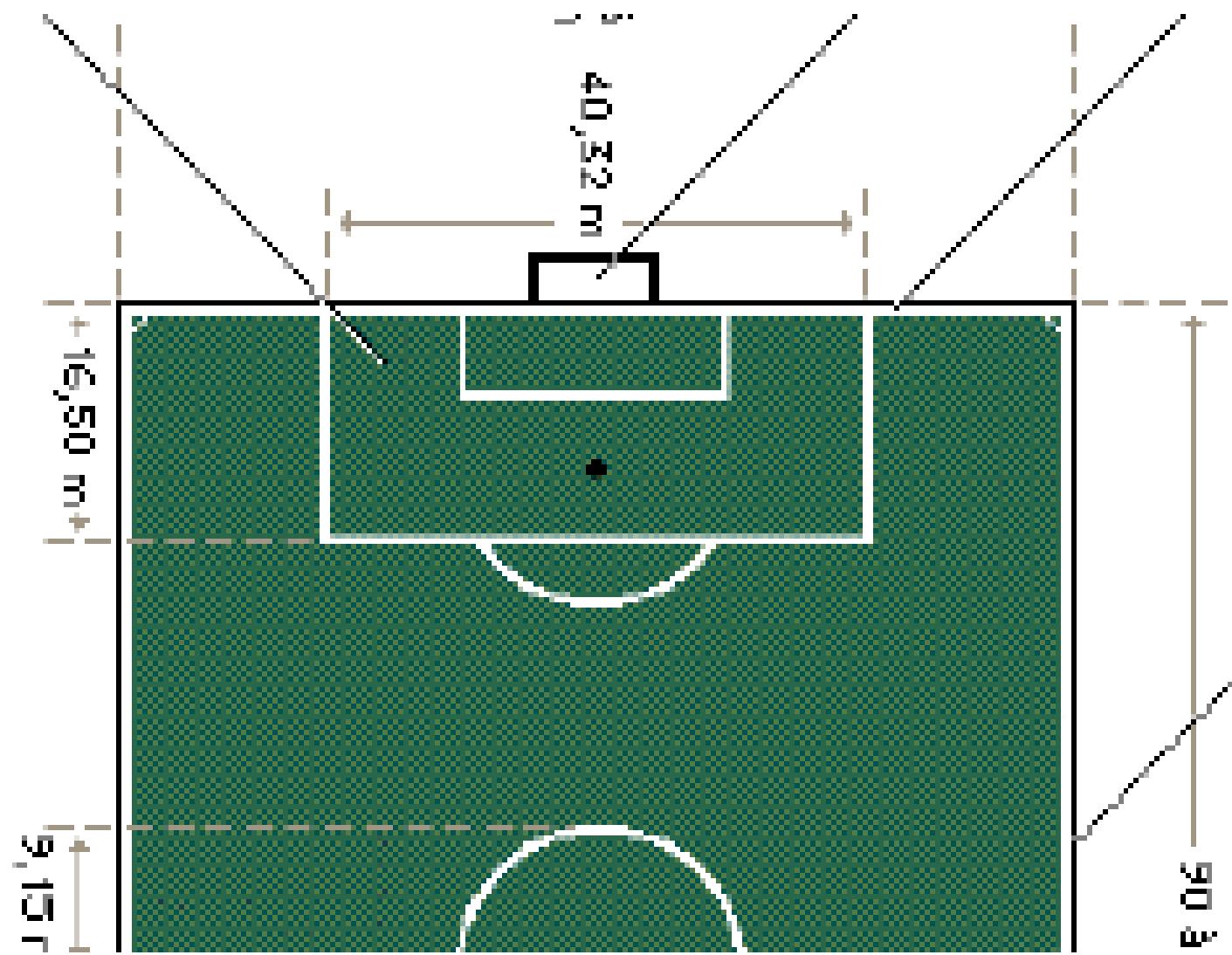
$$fX/Z + p_x, fY/Z + p_y$$

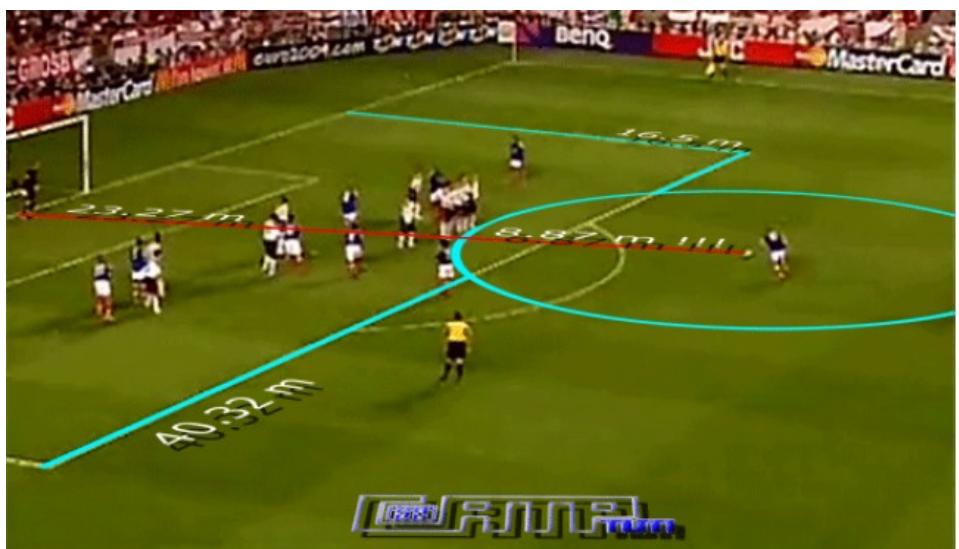
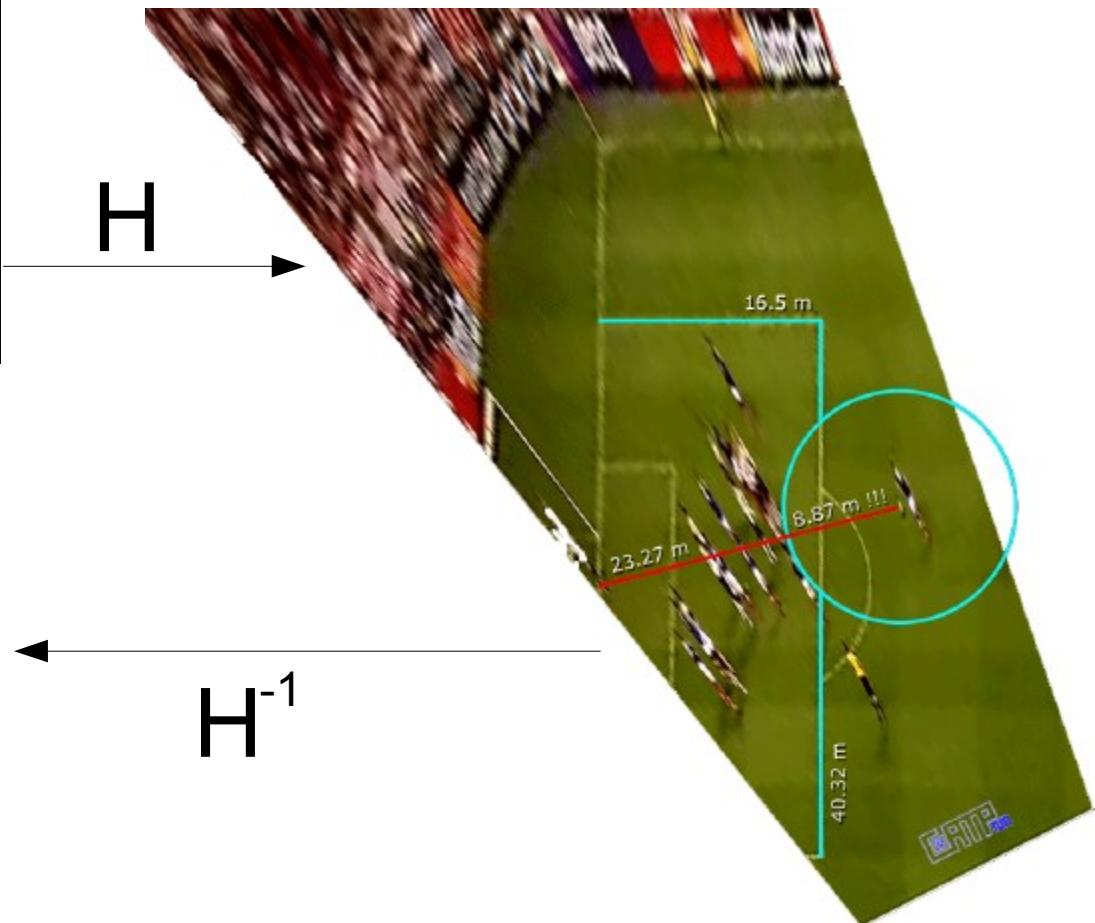
$$fX + p_xZ, fY + p_yZ, Z$$

$$K = \begin{bmatrix} f & & p_x \\ & f & p_y \\ & & 1 \end{bmatrix} \quad \text{Matrice de calibrage}$$

2 images en 2D

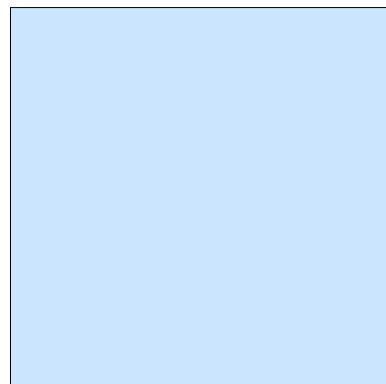




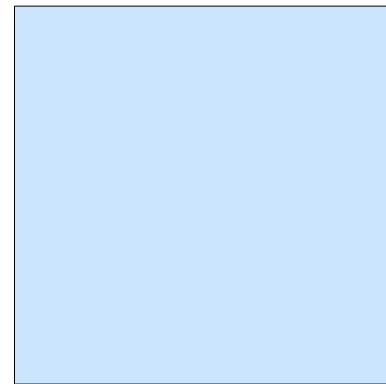
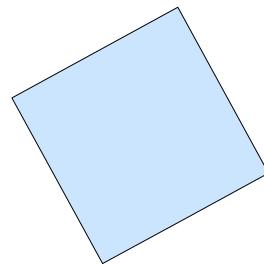


euclidienne

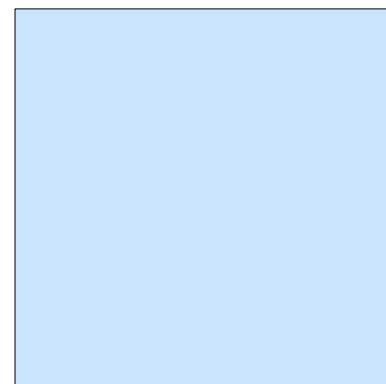
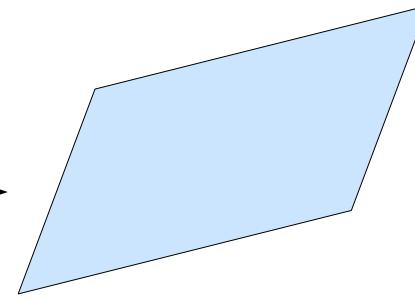
Ce qui est conservé



similitude



affine



projective
homographie

