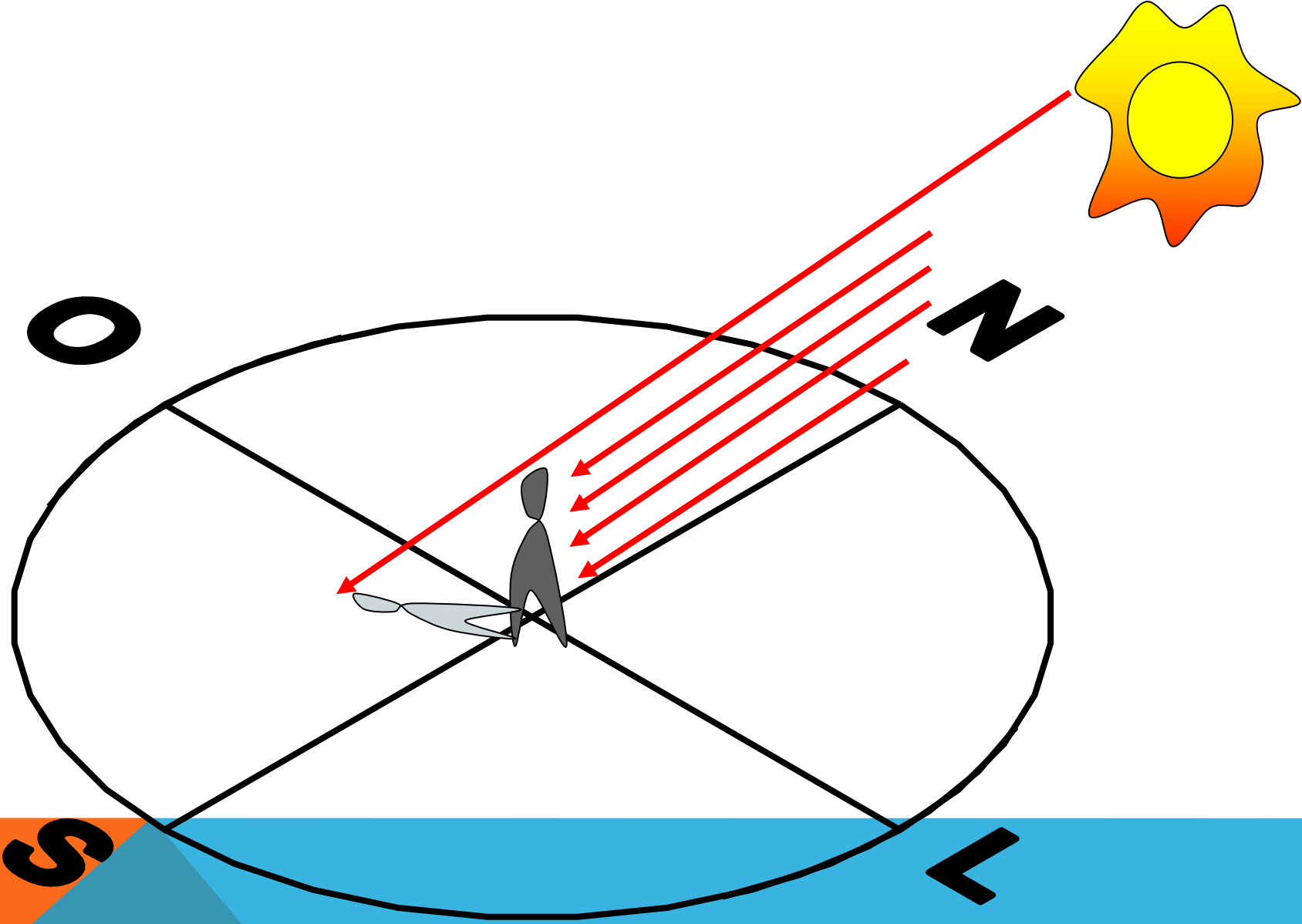
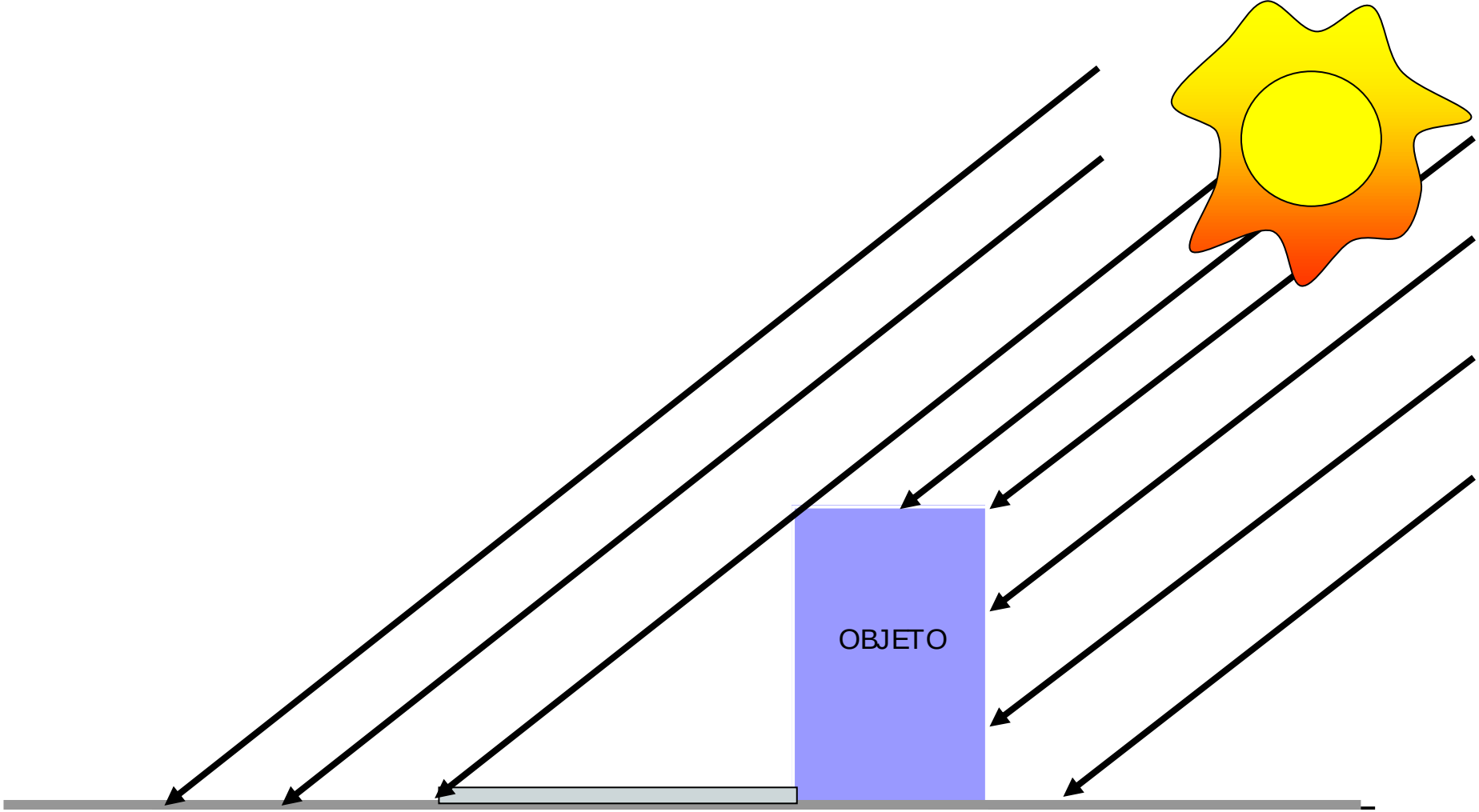
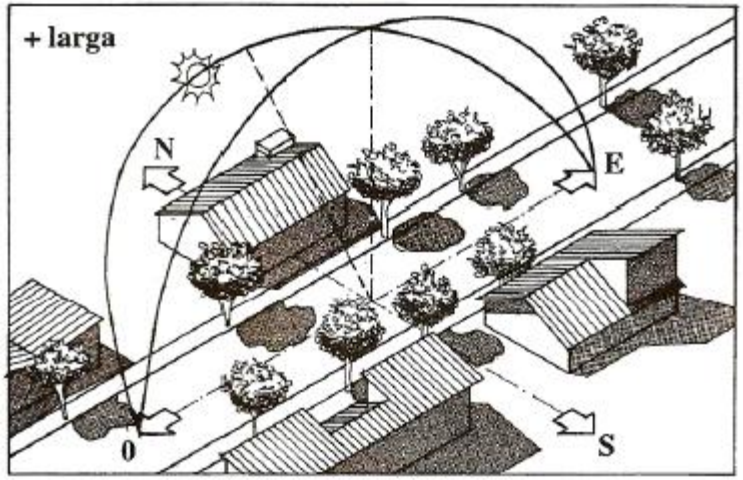
SOMBRA NO AMBIENTE CONSTRUÍDO

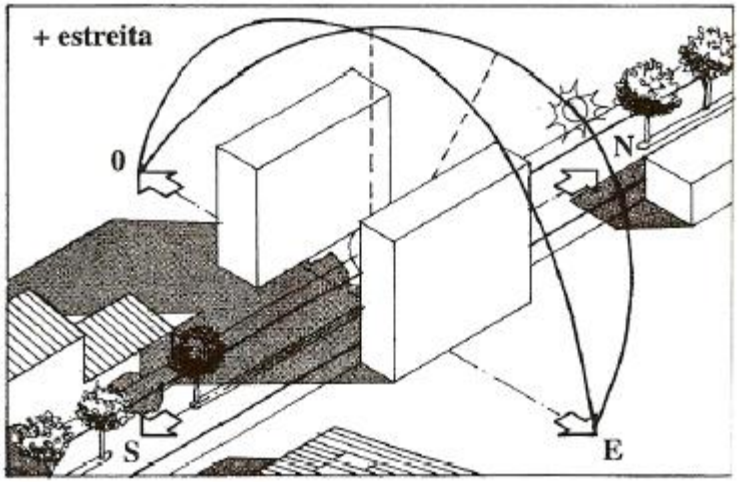


A SOMBRA do SOL !!!



A SOMBRA de um objeto no plano





Sombra

- ✓ Influência da altura e do azimute solar.
- ✓ Varia ao longo do dia e do ano.
- ✓ Dias mais críticos: solstícios, pois as sombras causadas pelas edificações são mais extensas (baixa altura solar).
- ✓ Os raios solares incidem mais nos ambientes!!!

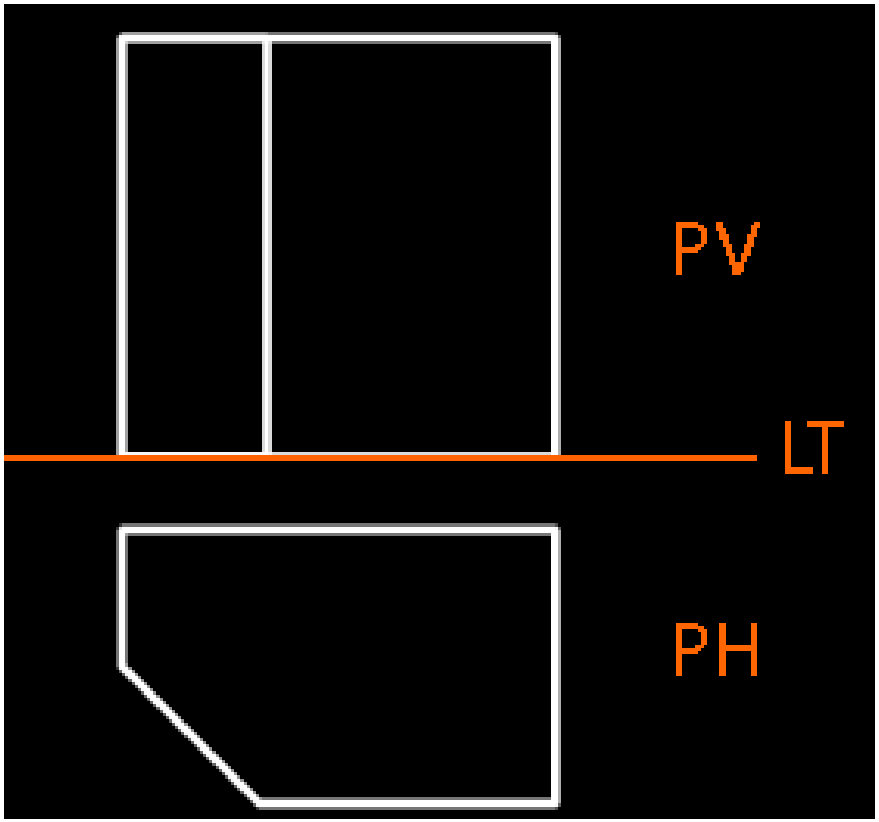




O entorno como BARREIRA contra a LUZ DIRETA

Roteiro

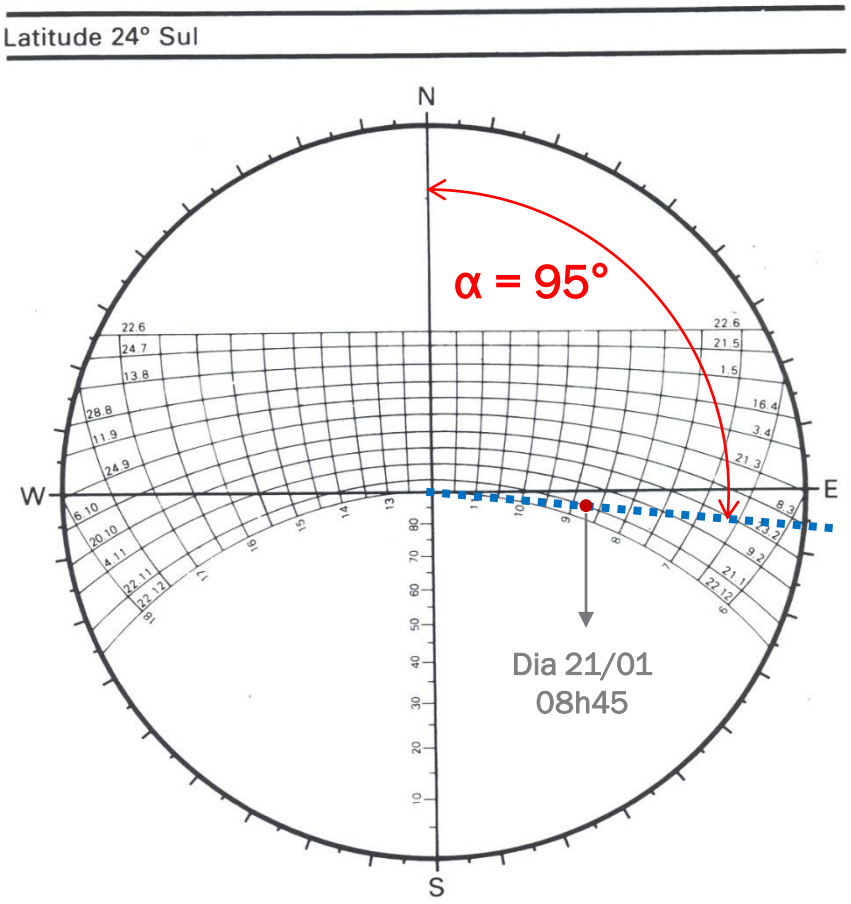
Passo 1: Desenho em Planta (PH) LT e vista (PV) com orientação de acordo com o Norte



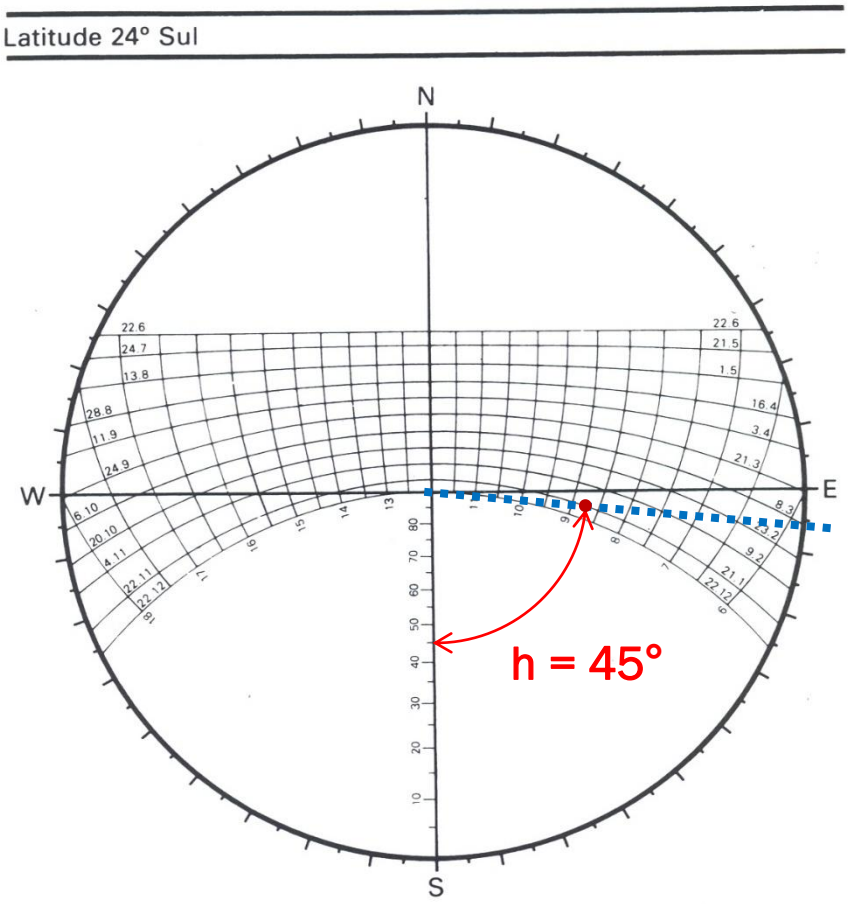
Passo 2: Qual a altura solar e o azimute solar ? Verificar na Carta Solar

Passo 3: Fazer um croqui em Épura mostrando onde está o Sol e a sombra de uma haste

Azimute (α)



Altura Solar (h)



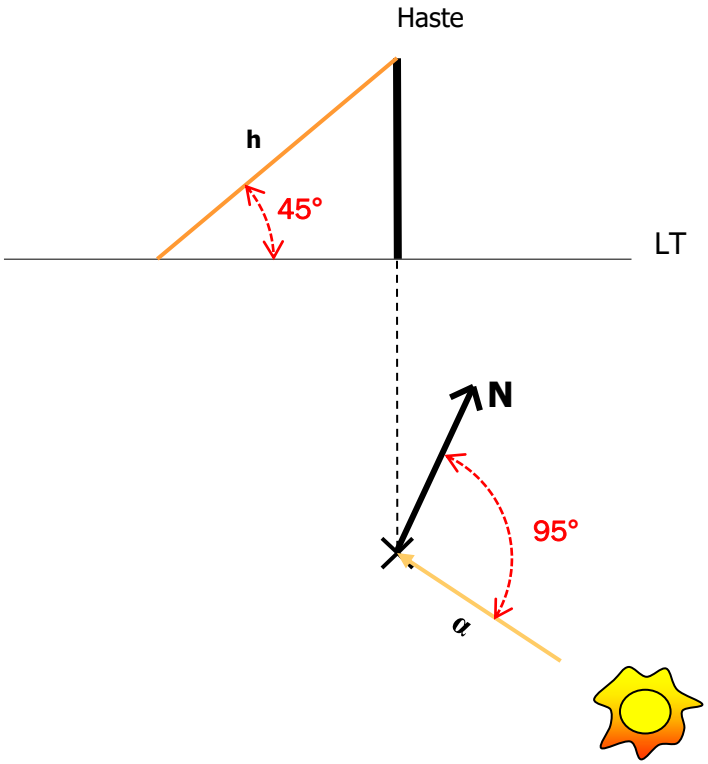
PASSO 2: Qual a altura solar e o azimute solar ? Verificar na Carta Solar

Encontrar, na carta solar, os valores do azimute e da altura solar.

Roteiro

Passo 3: Fazer um croqui em Épura mostrando onde está o Sol e a sombra de uma haste

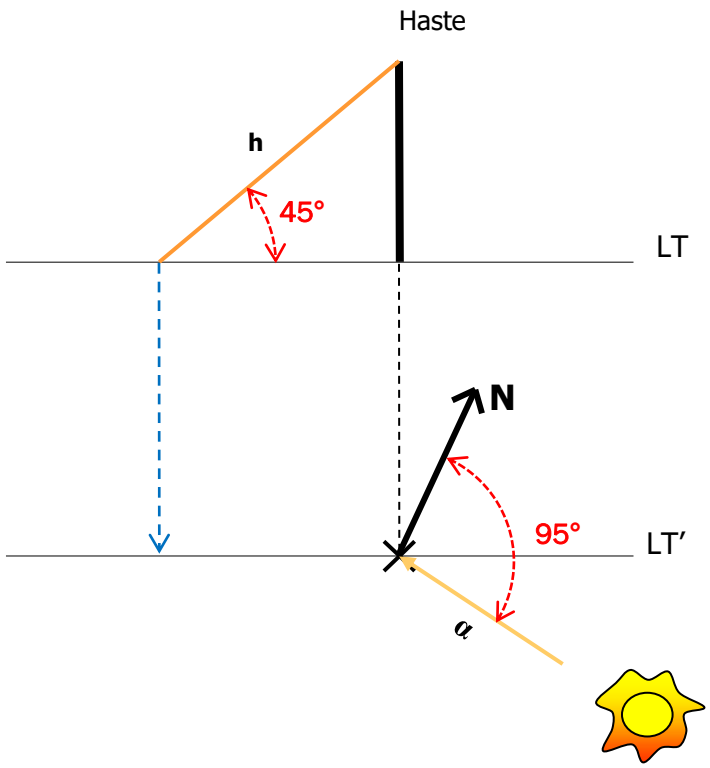
Vista Lateral



Vista Superior

A partir de uma haste auxiliar, traçar o azimute e a altura solar

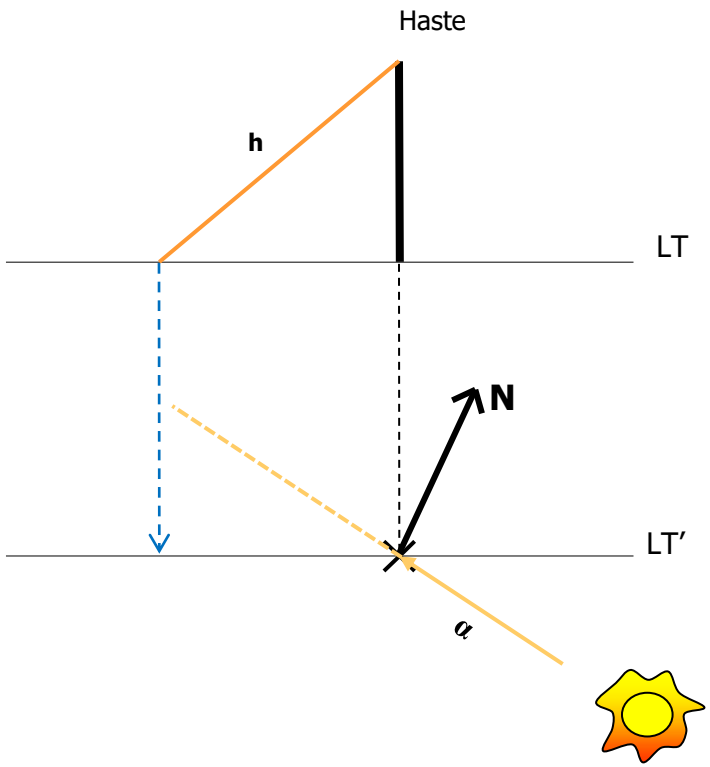
Vista Lateral



Vista Superior

Traçar o plano vertical paralelo a linha de terra (LT), passando pela base da haste em vista superior (Linha de Terra Auxiliar – LT'). Em seguida, traçar uma linha que passa pela extremidade da sombra até o plano vertical paralelo LT'.

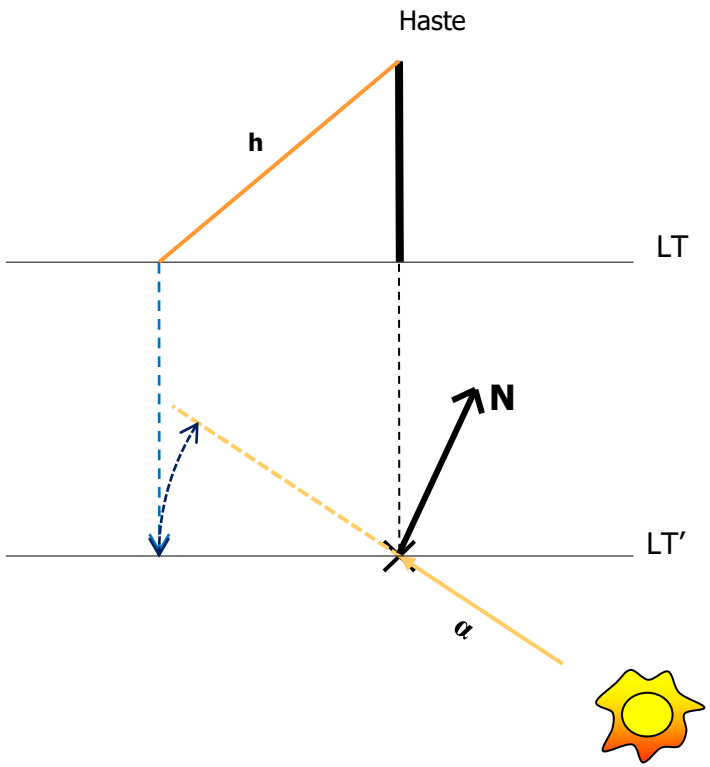
Vista Lateral



Vista Superior

Traçar a direção da sombra, estendendo o azimute (Direção = α+180° > face oposta à direção do sol).

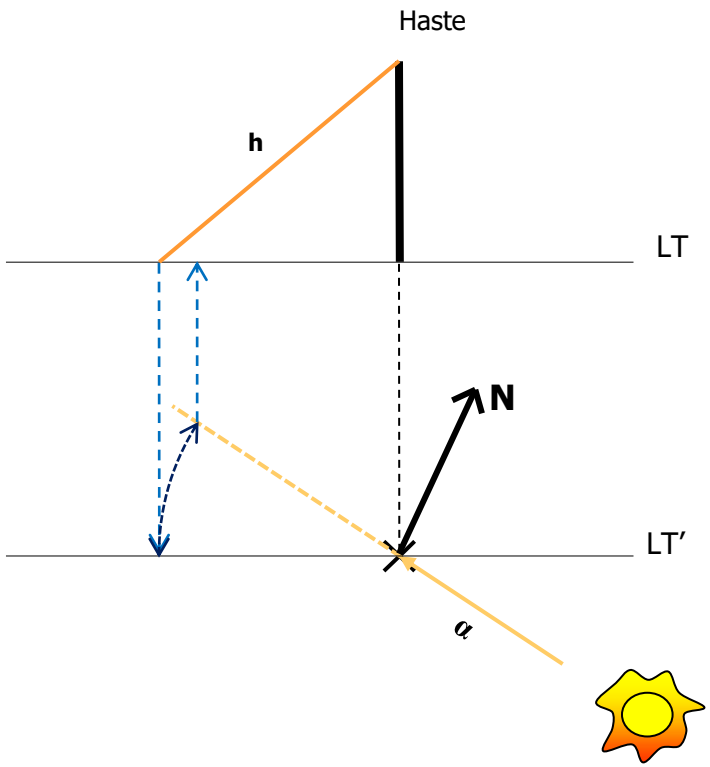
Vista Lateral



Vista Superior

Rebater o plano vertical até encontrar a extensão do azimute.

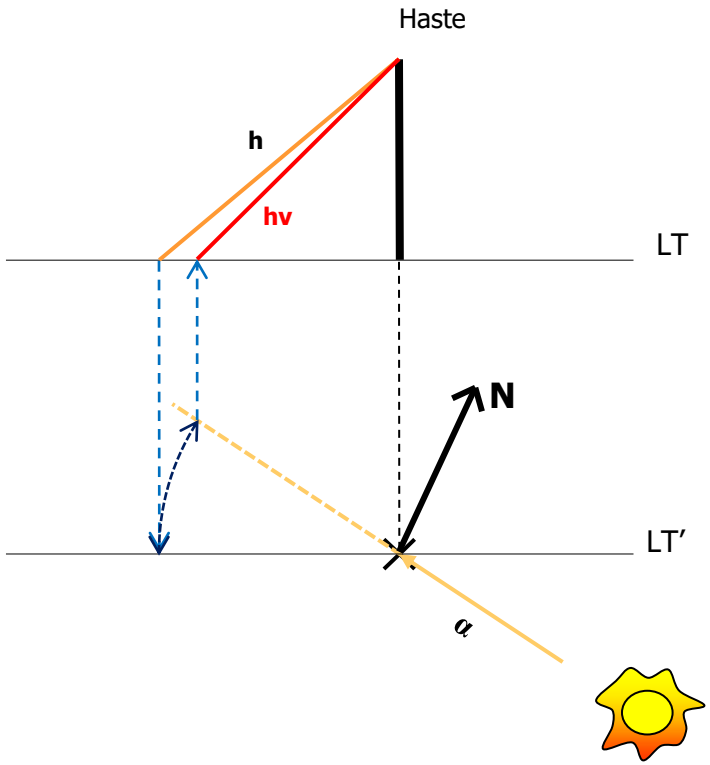
Vista Lateral



Vista Superior

Projetar o ponto encontrado até o plano vertical LT.

Vista Lateral



Vista Superior

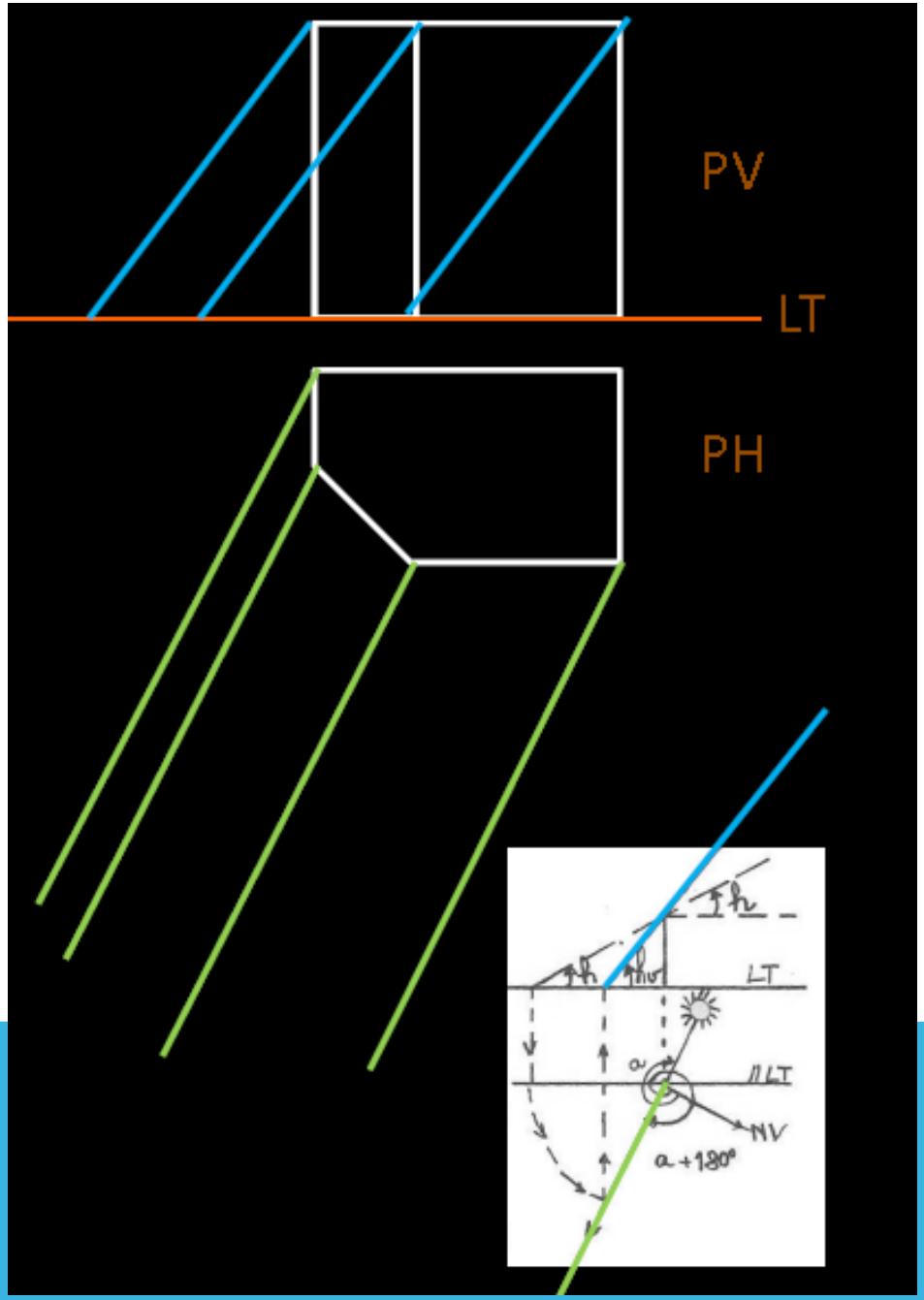
Traçar a altura projetada (hv) no plano vertical.

Roteiro

Passo 4: Utilizar hv para desenhar as sombras no PV

Passo 5: Utilizar azimute + 180º para projetar as sombras no PH

Passo 6: Cruzar estas linhas para obtenção das sombras em planta e vista

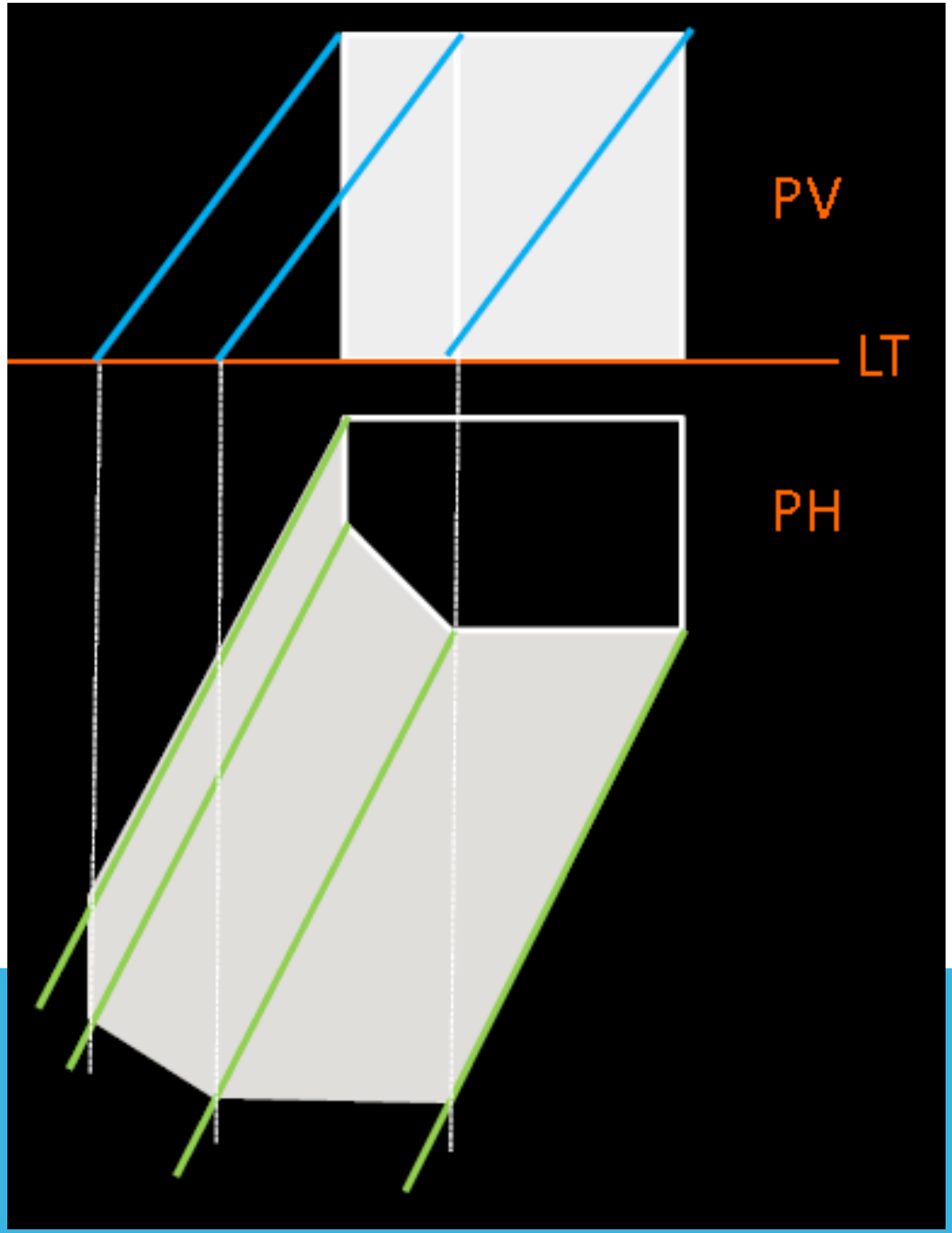


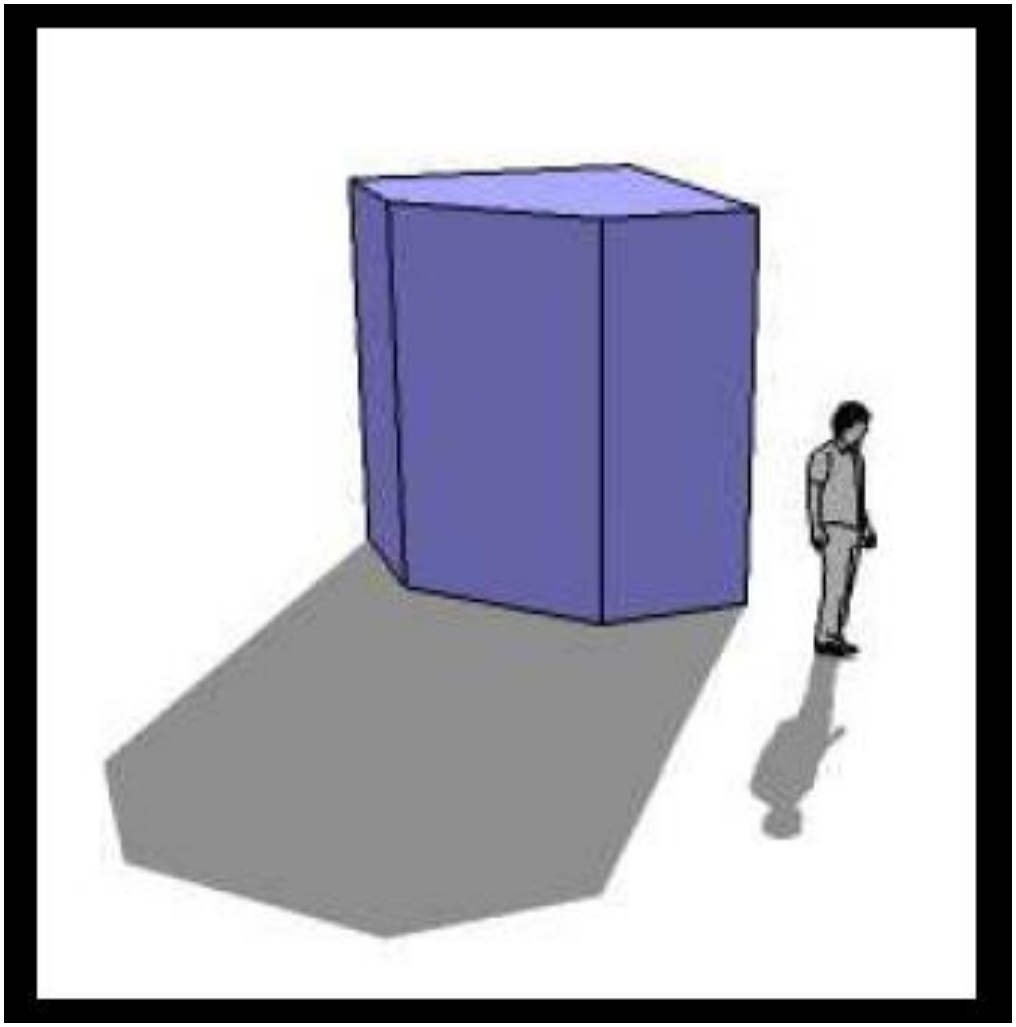
Roteiro

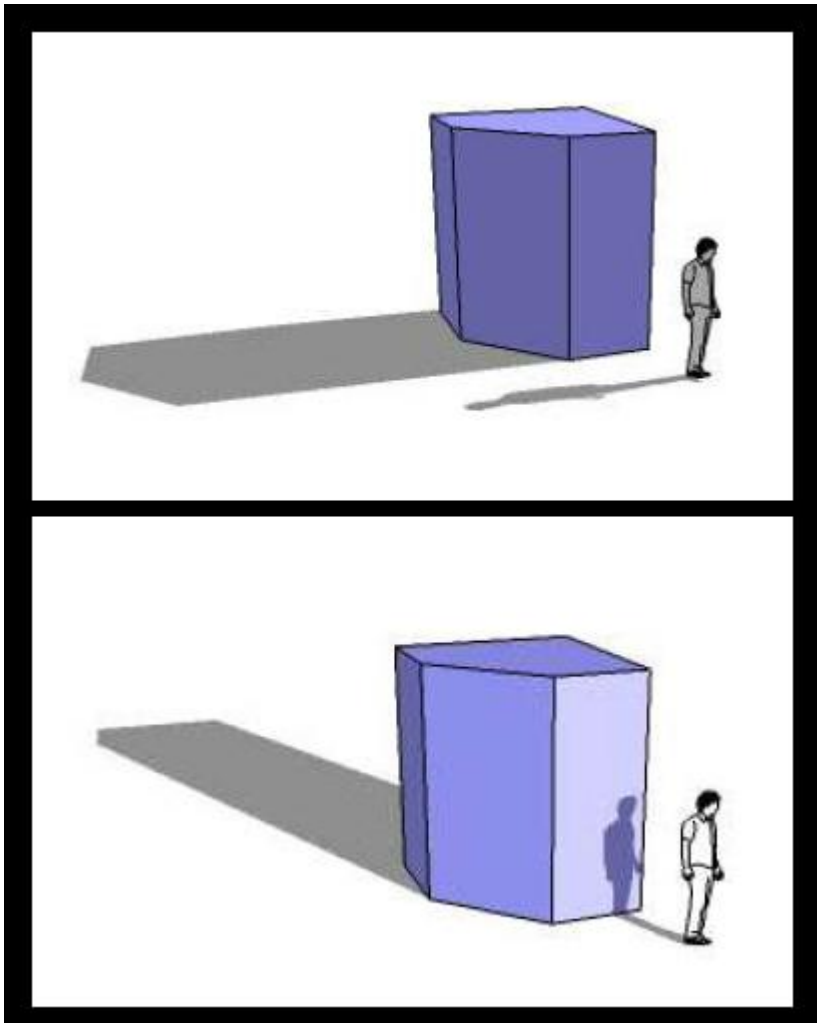
Passo 4: Utilizar **hv** para desenhar as sombras no PV

Passo 5: Utilizar **azimute + 180º** para projetar as sombras no PH

Passo 6: Cruzar estas linhas para obtenção das sombras em planta e vista



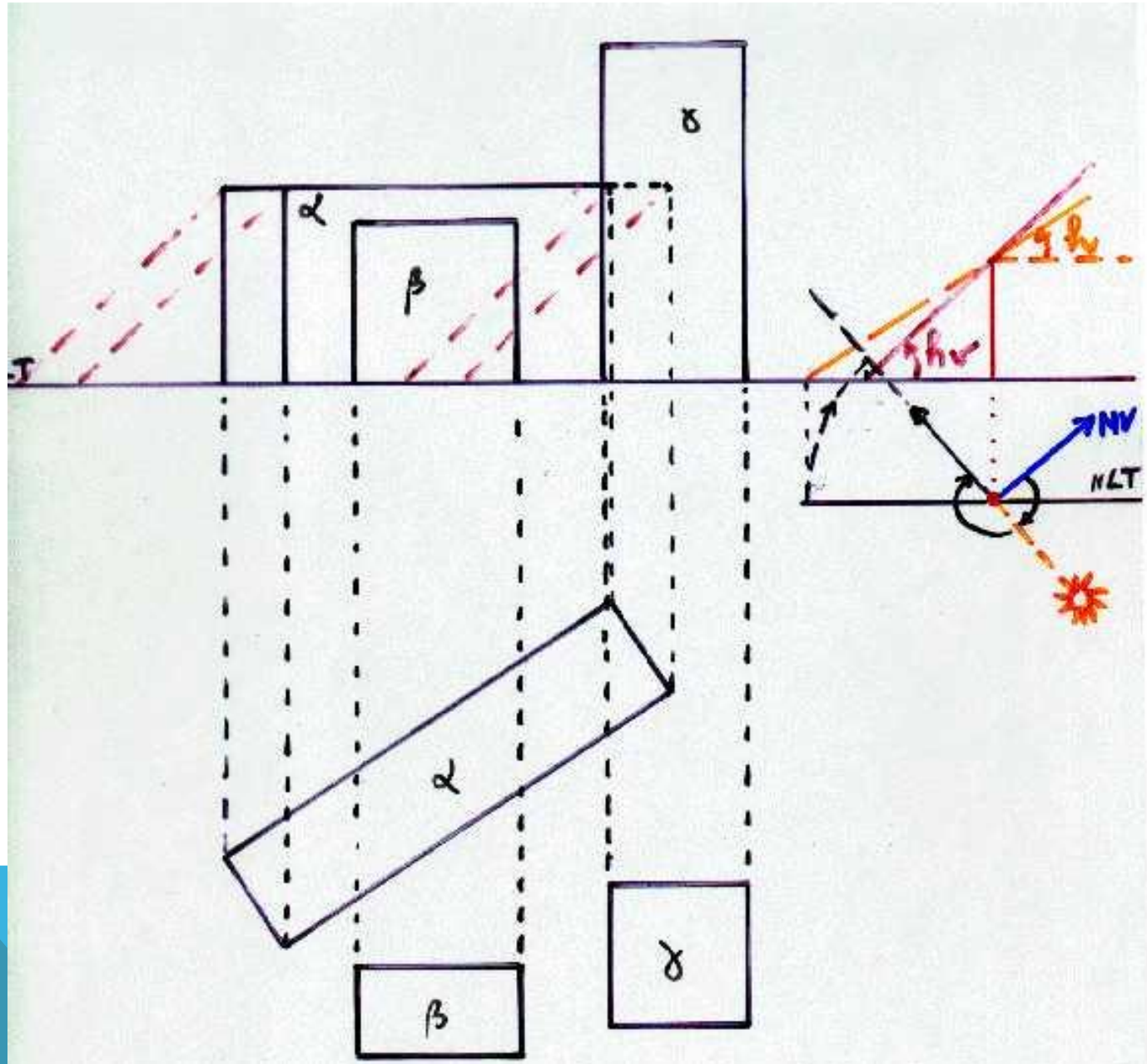




MODELOS TRIDIMENSIONAIS

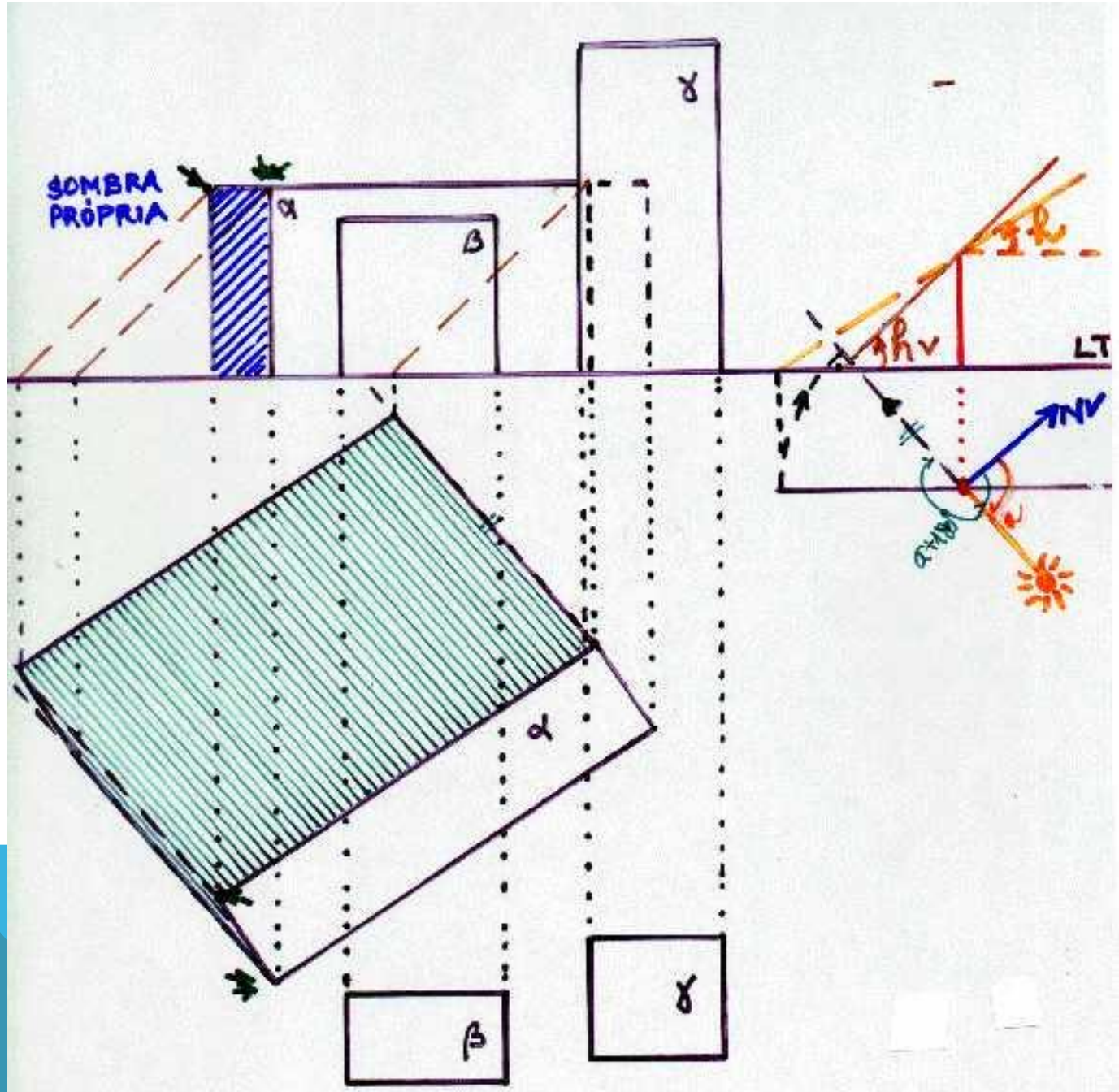
Auxiliam a visualizar as interferências de elementos e o sombreamento

EXEMPLO



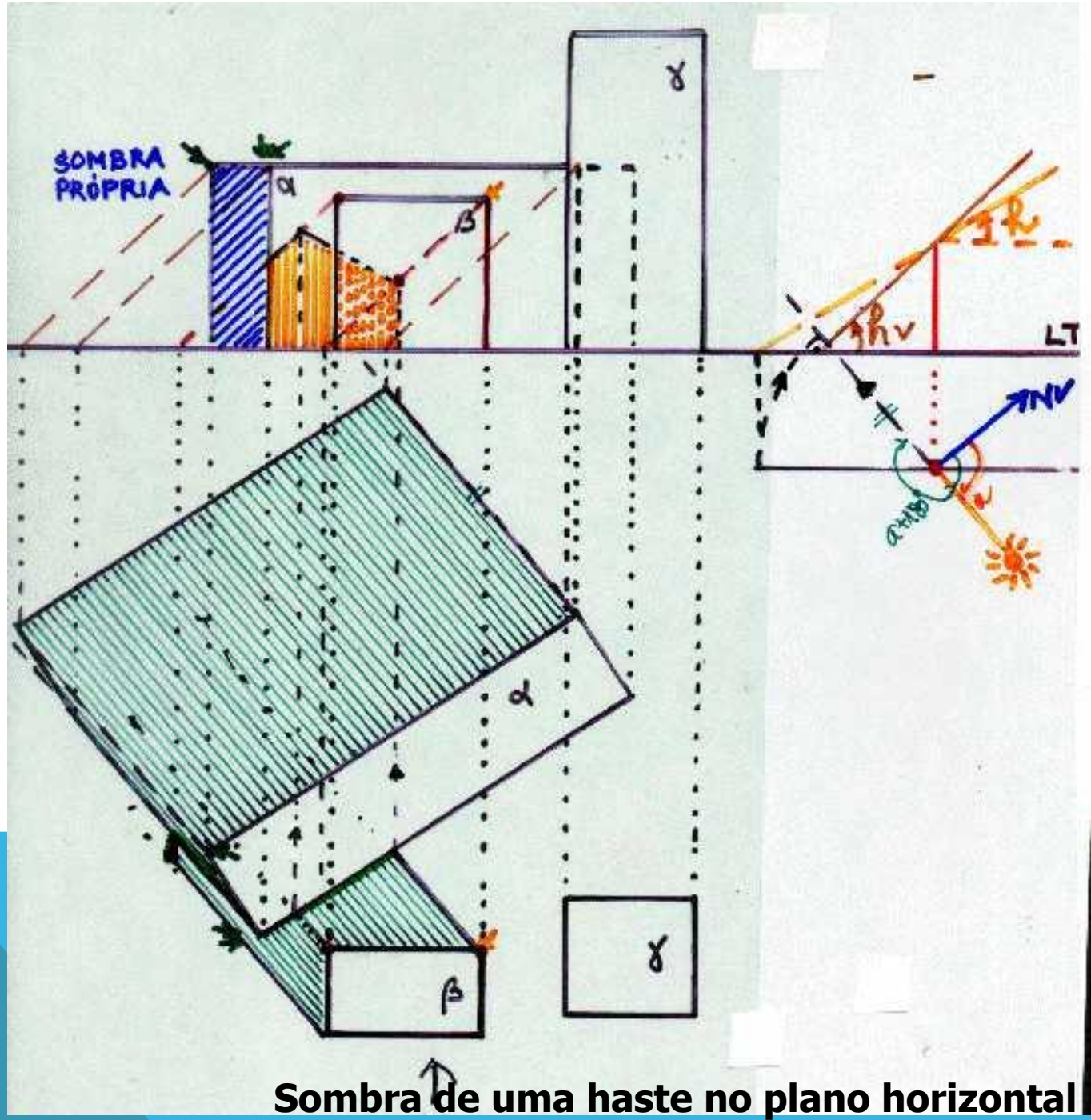
Sombra de uma haste no plano horizontal

EXEMPLO



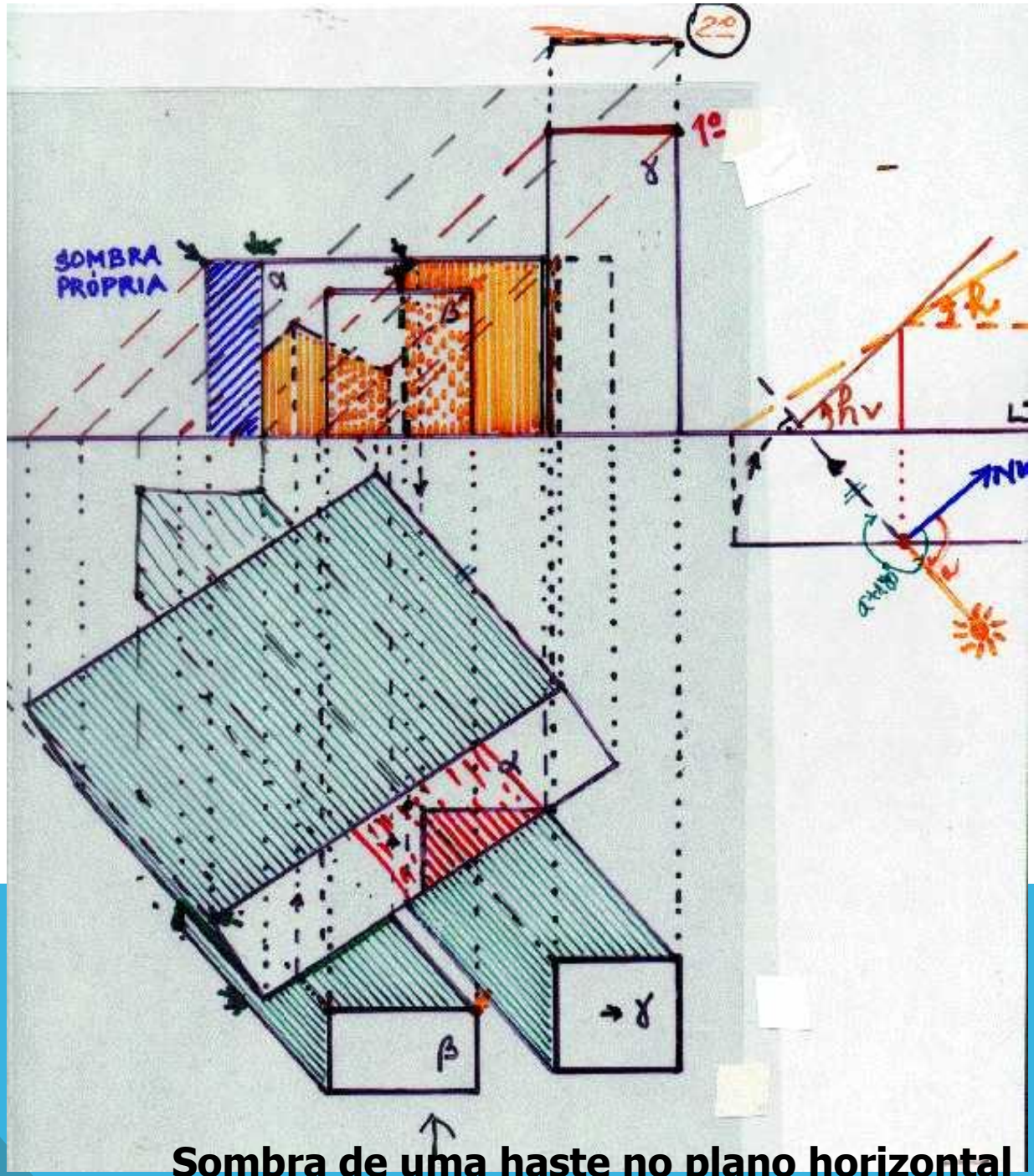
Sombra de uma haste no plano horizontal

EXEMPLO



Sombra de uma haste no plano horizontal

EXEMPLO

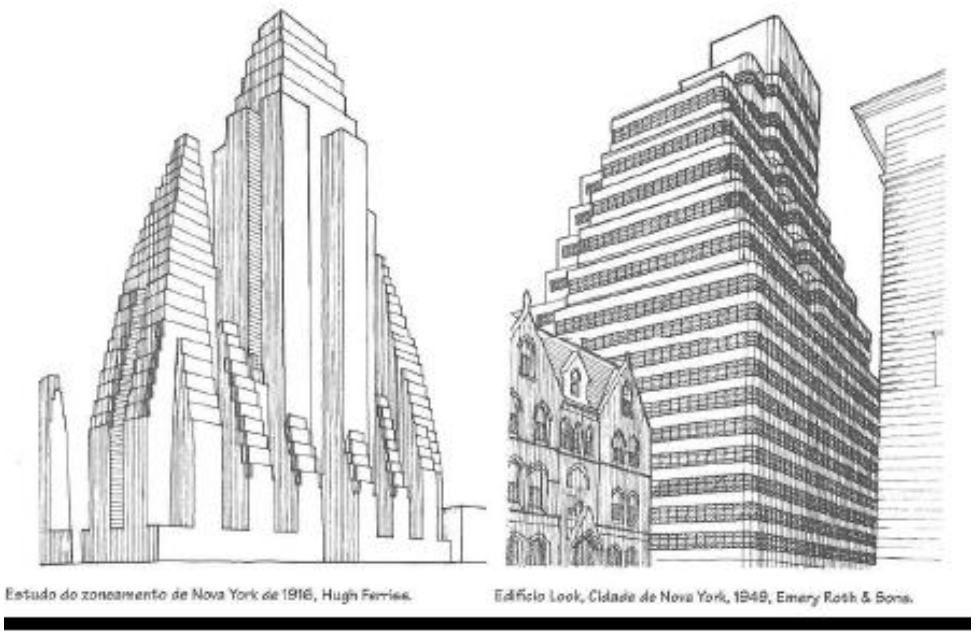


Sombra de uma haste no plano horizontal

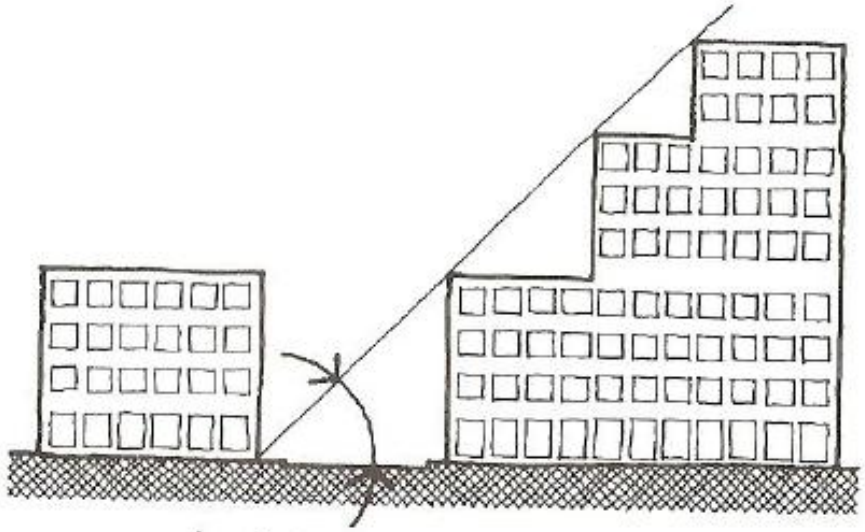
Alternativas de projeto

Prismas de Iluminação: podem ser usados para dar formas às edificações e recuá-las de modo a garantir níveis de iluminação adequados nas ruas e edificações adjacentes.

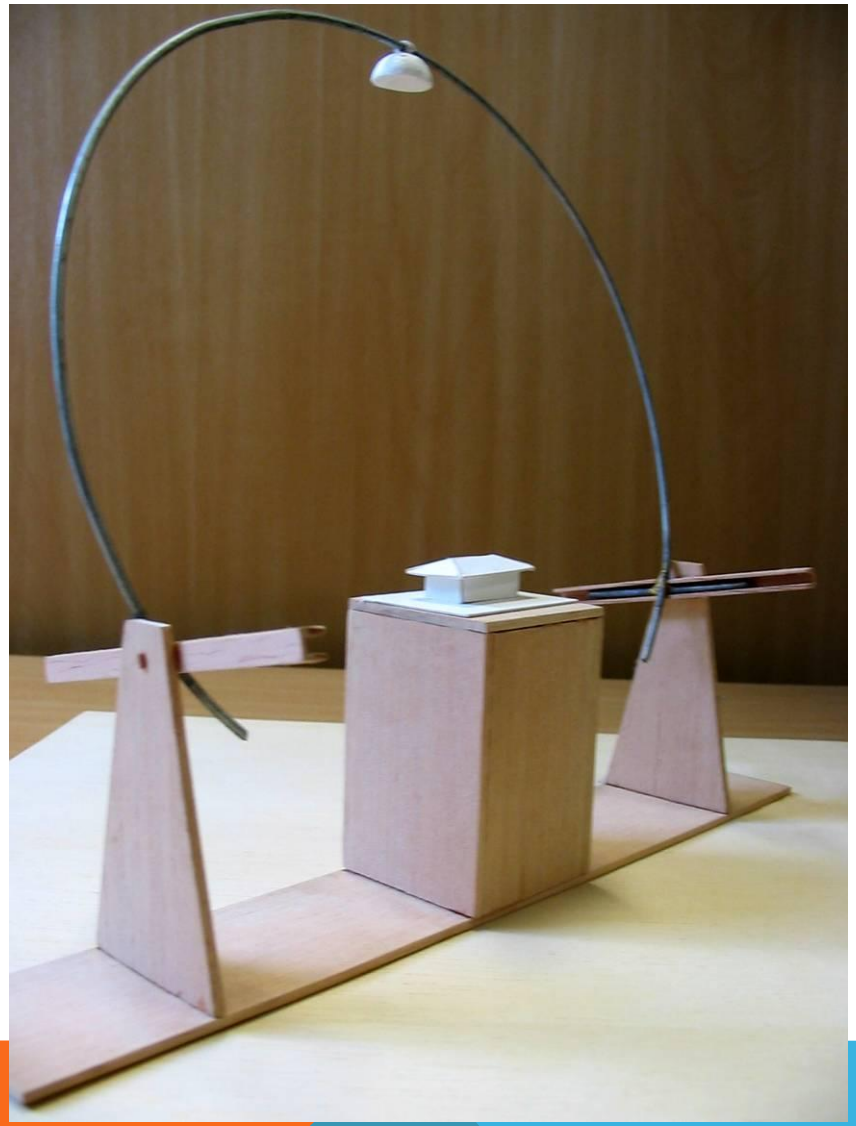
Ângulos de recuos para iluminância adequada: dependem da altura solar, portanto, variam conforme a latitude.

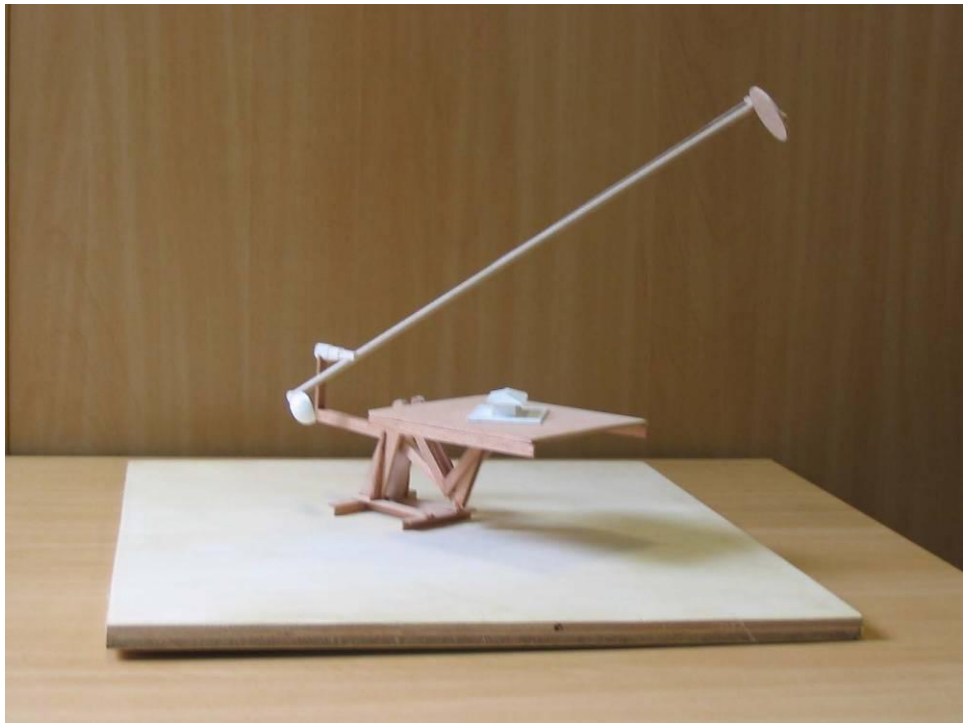


Estudo do zoneamento de Nova York de 1916, Hugh Ferriss. Edifício Look, Cidade de Nova York, 1949, Emery Roth & Sons.



Ângulo de recuo (em graus).





HELIODON DE ARCO E COM HASTE



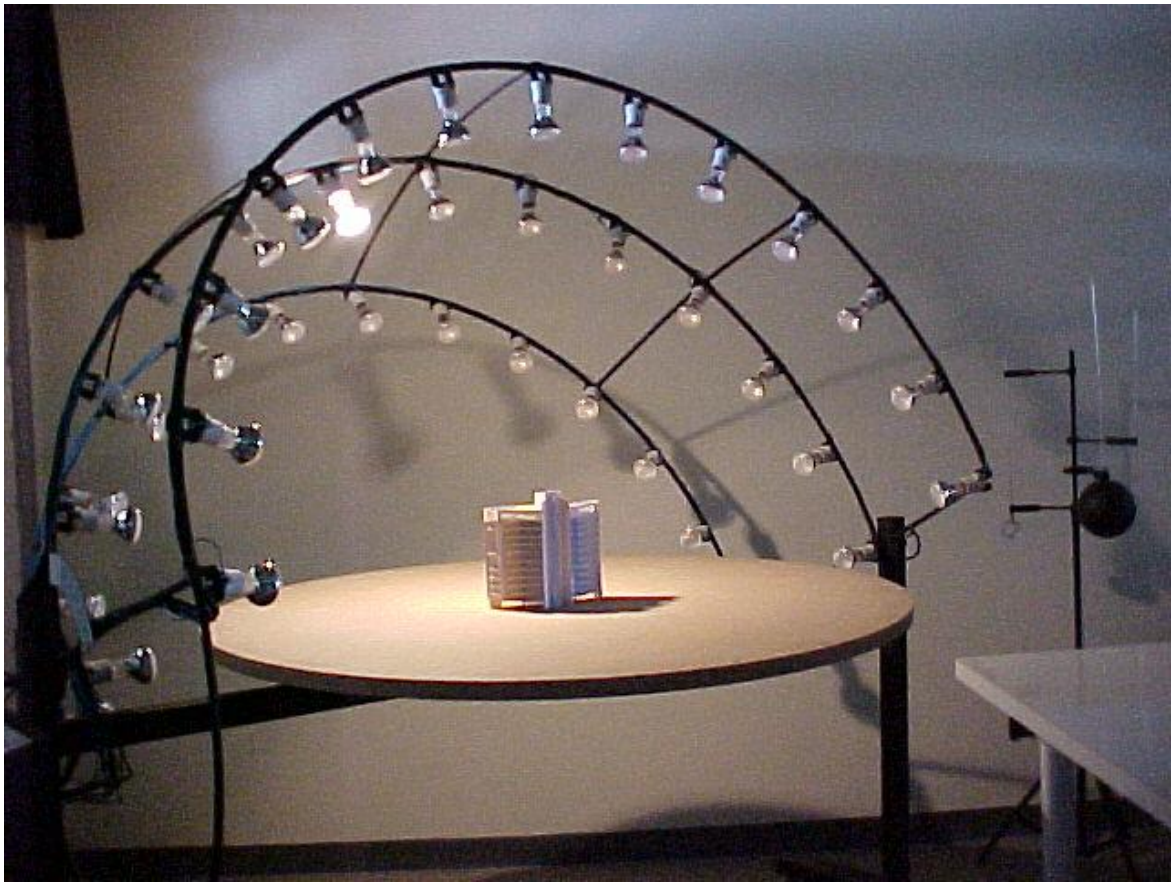




HELIODON DE ARCO



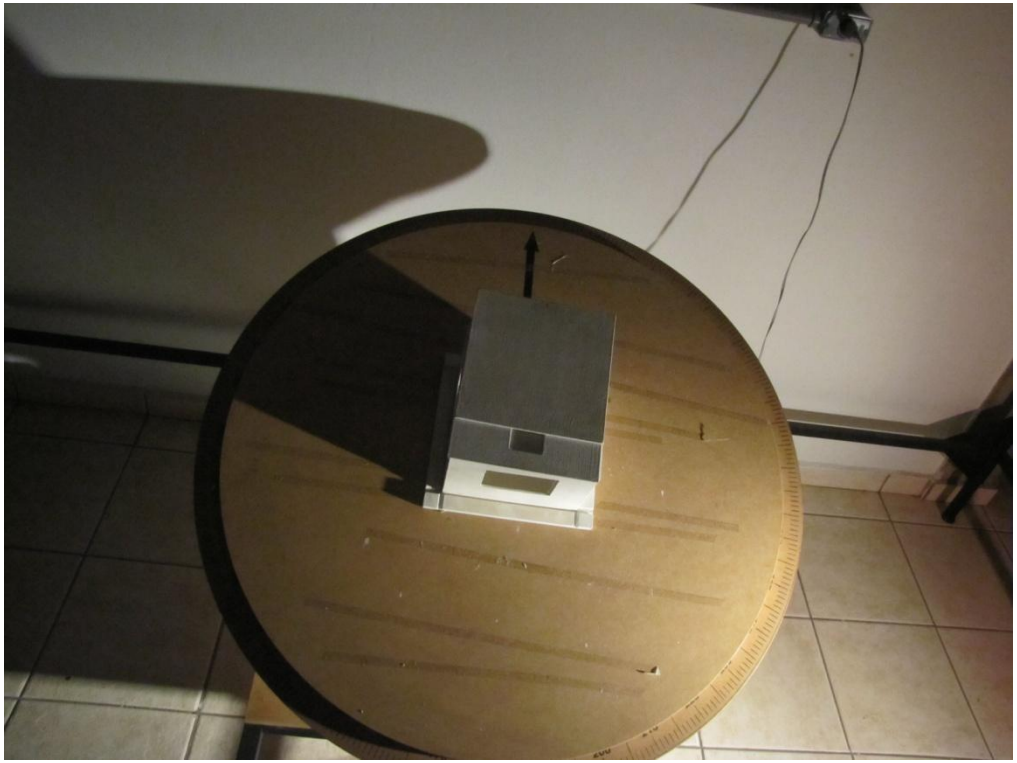




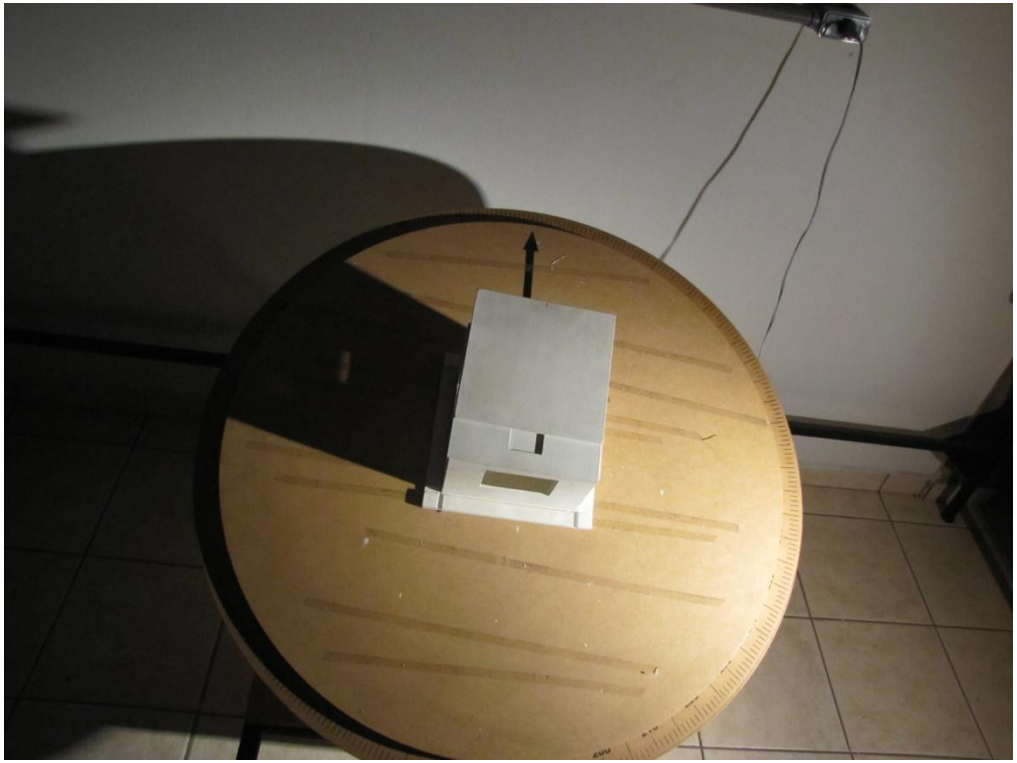
HELIODON DE TRÊS ARCOS ... exemplo!

ESTUDO DE INSOLAÇÃO

Solstício de Verão – 6h



Solstício de Verão – 7h



Solstício de Verão – 8h



Solstício de Verão – 9h



Solstício de Verão – 10h



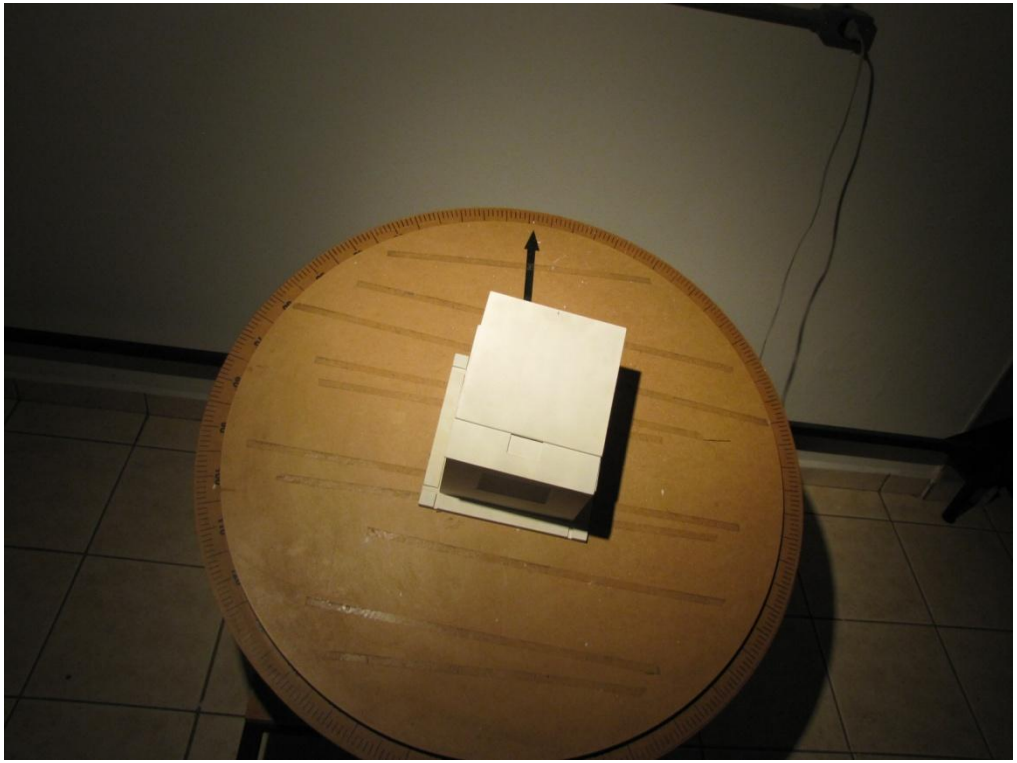
Solstício de Verão – 11h



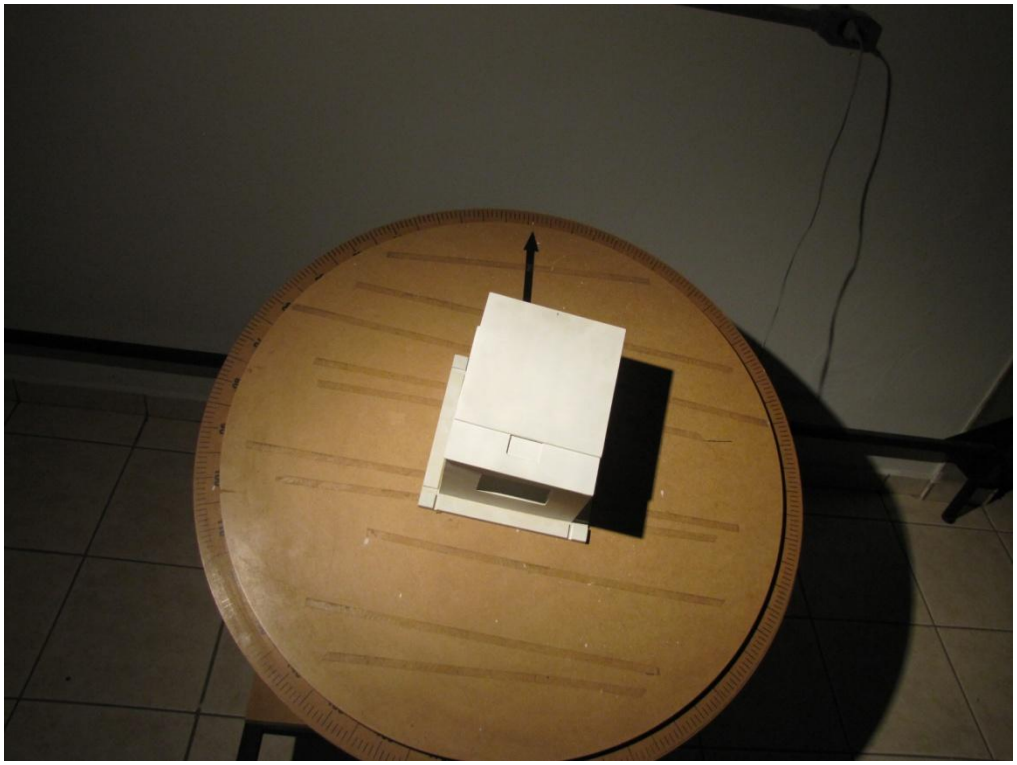
Solstício de Verão – 12h



Solstício de Verão – 13h



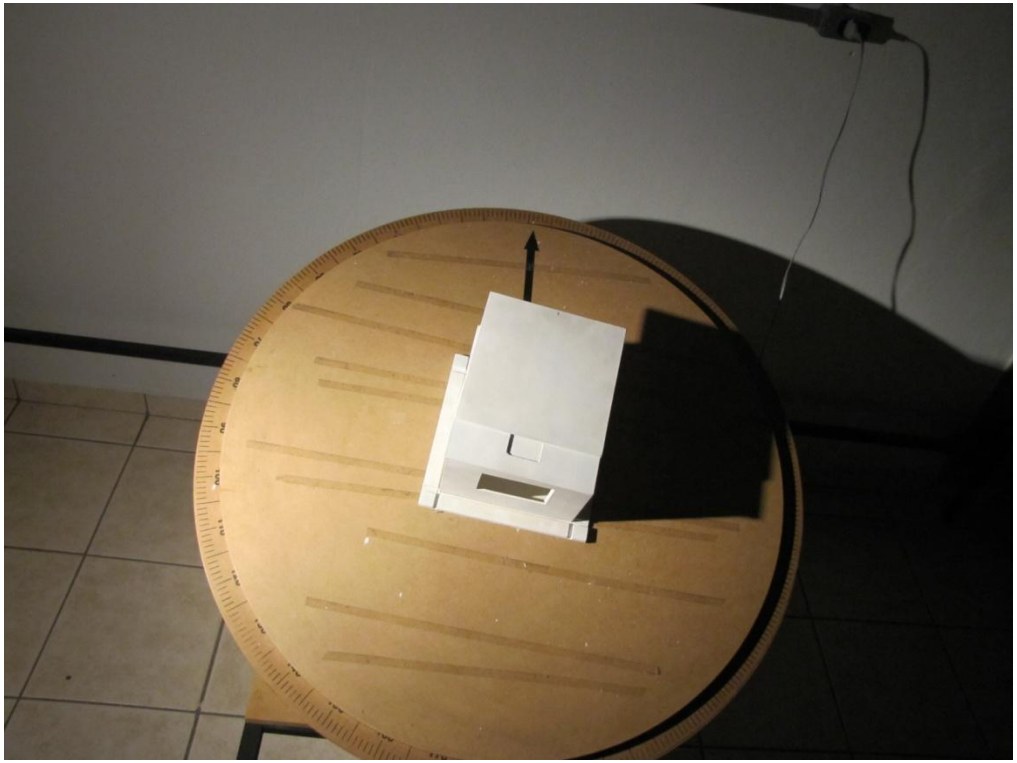
Solstício de Verão – 14h



Solstício de Verão – 15h



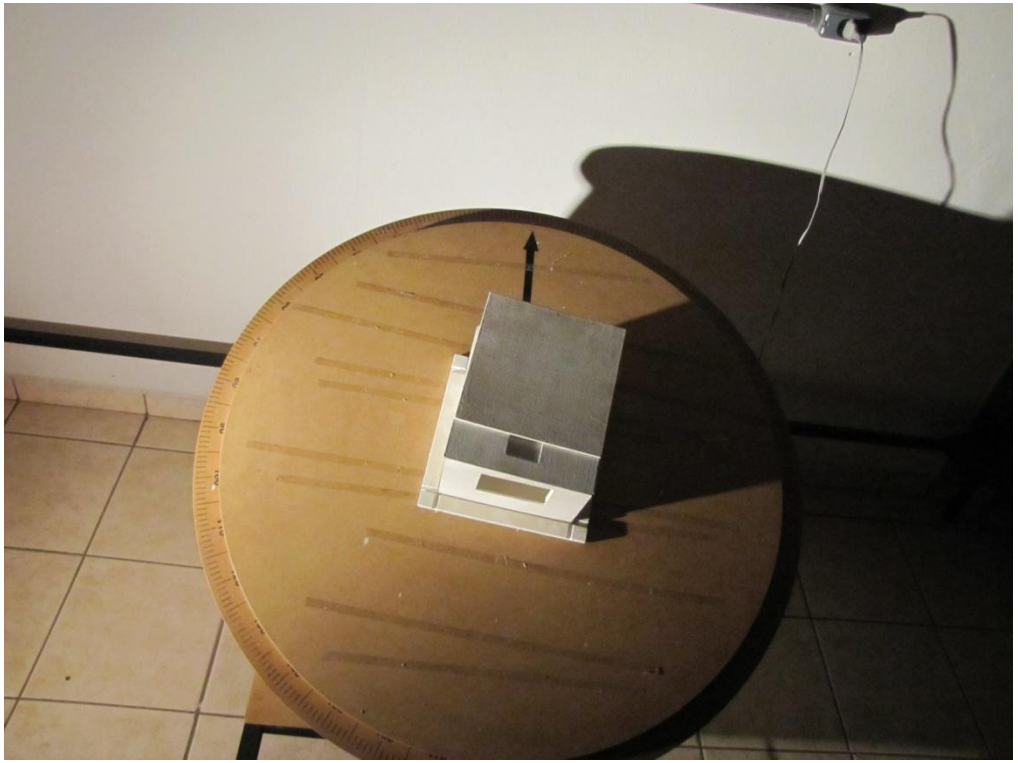
Solstício de Verão – 16h



Solstício de Verão – 17h



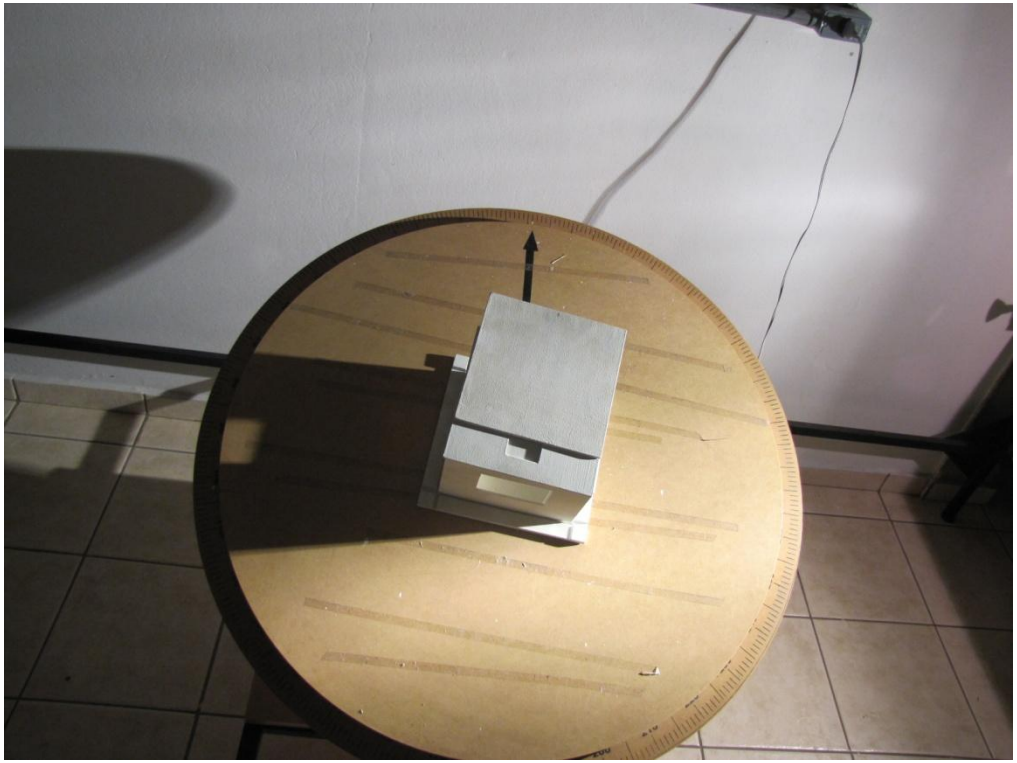
Solstício de Verão – 18h



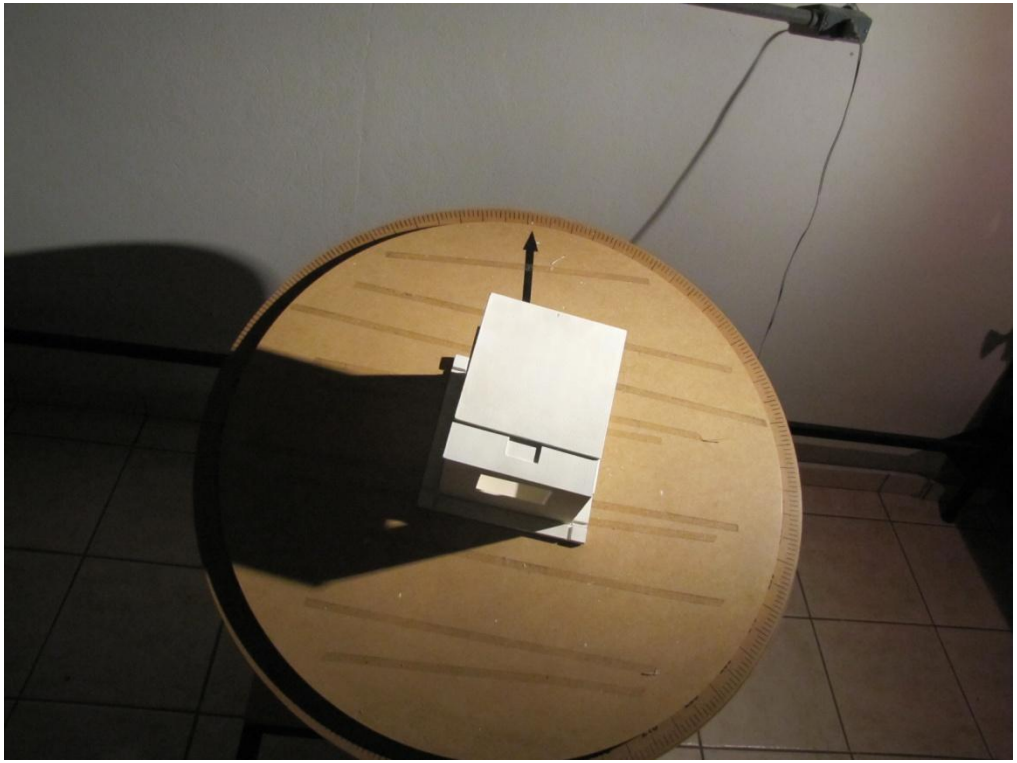
Equinócio – 6h



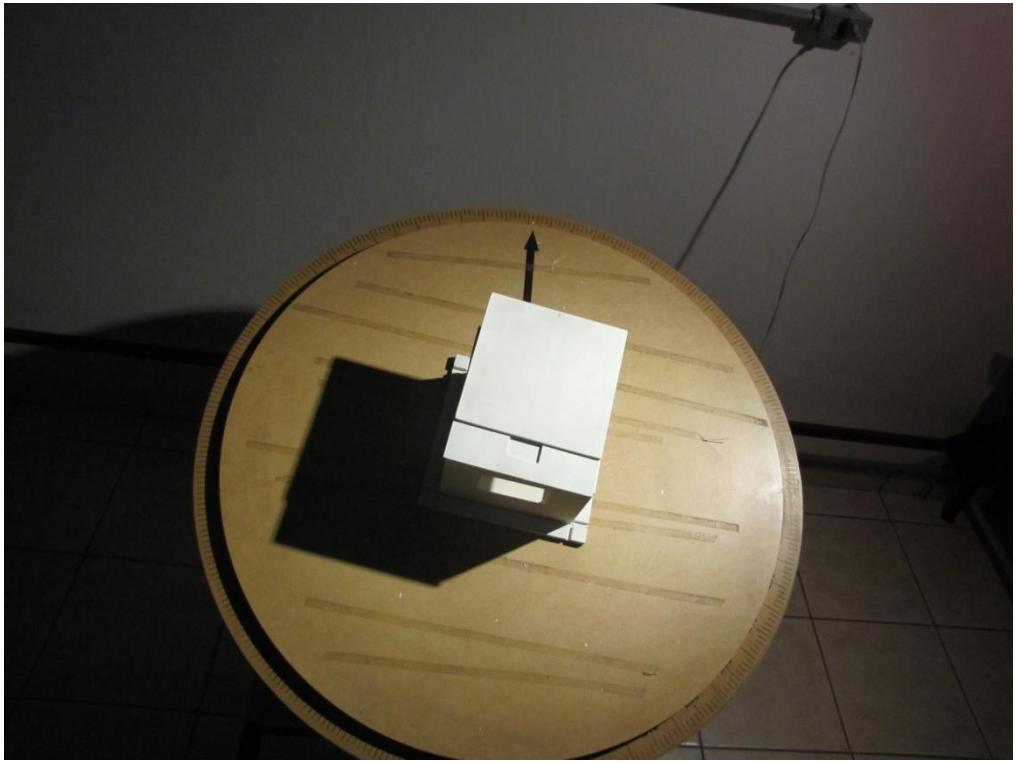
Equinócio – 7h



Equinócio – 8h



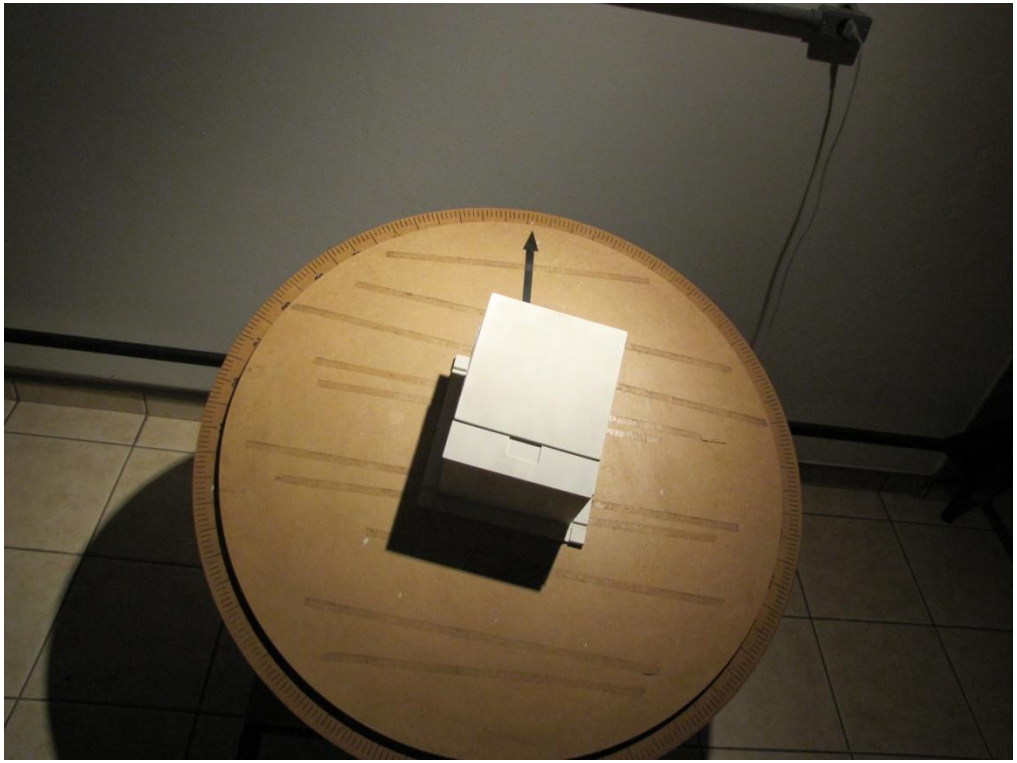
Equinócio – 9h



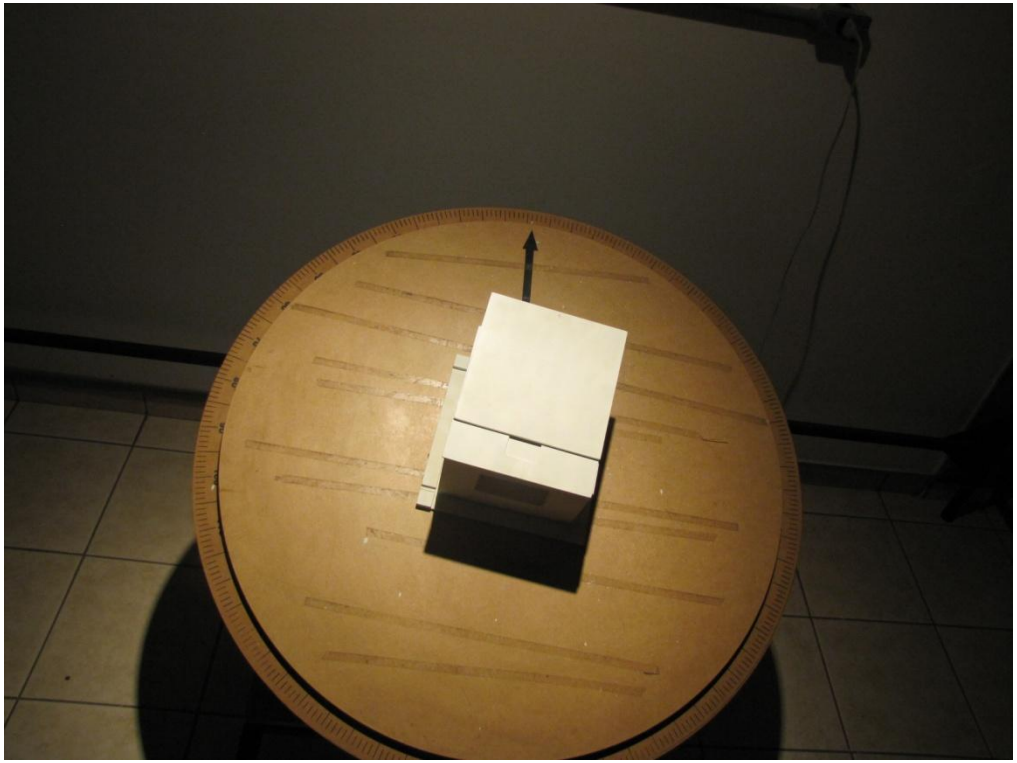
Equinócio – 10h



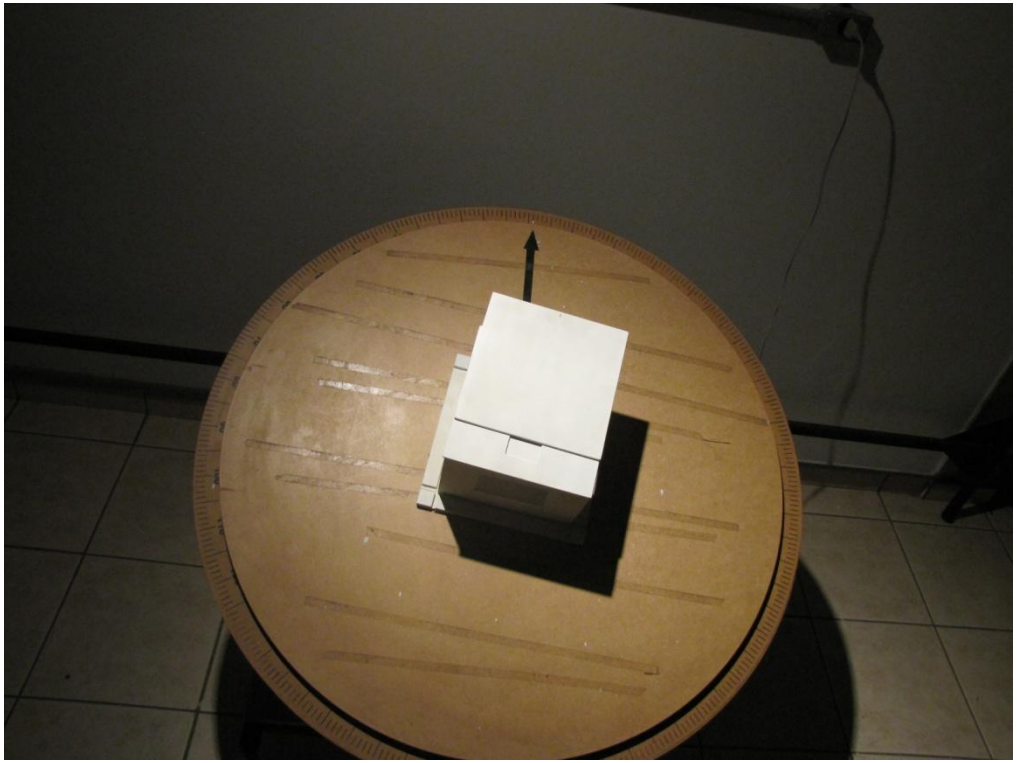
Equinócio– 11h



Equinócio– 12h



Equinócio – 13h



Equinócio – 14h



Equinócio – 15h



Equinócio – 16h



Equinócio – 17h



Equinócio – 18h



Solstício de Inverno – 6h



Solstício de Inverno – 7h



Solstício de Inverno – 8h



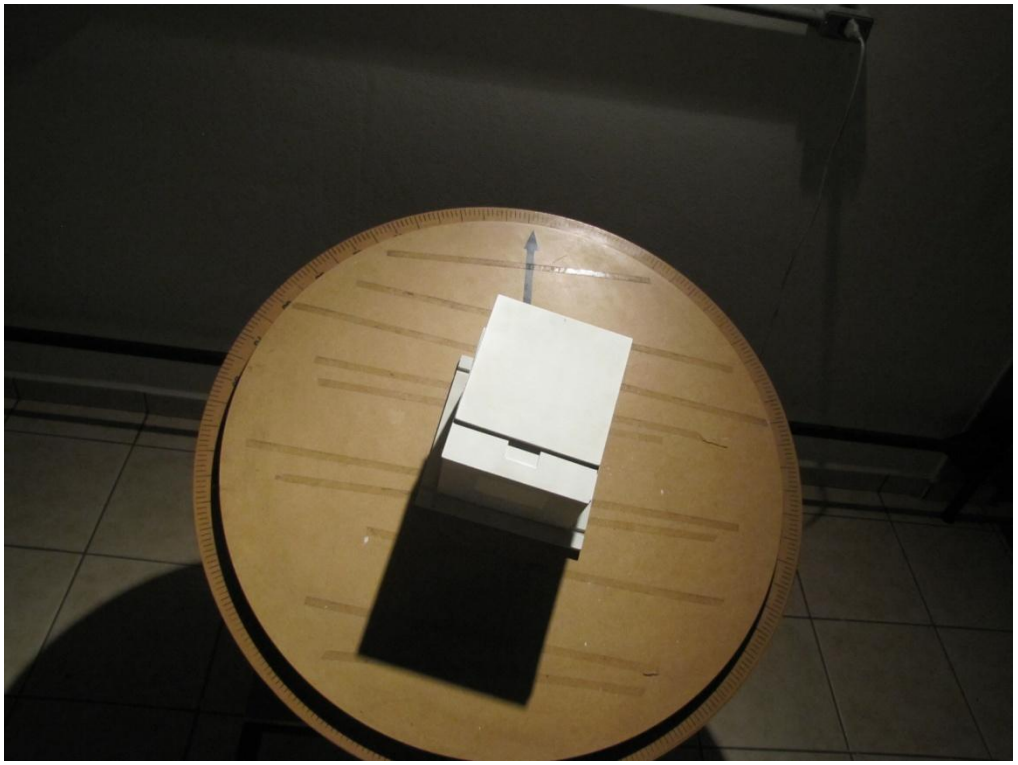
Solstício de Inverno – 9h



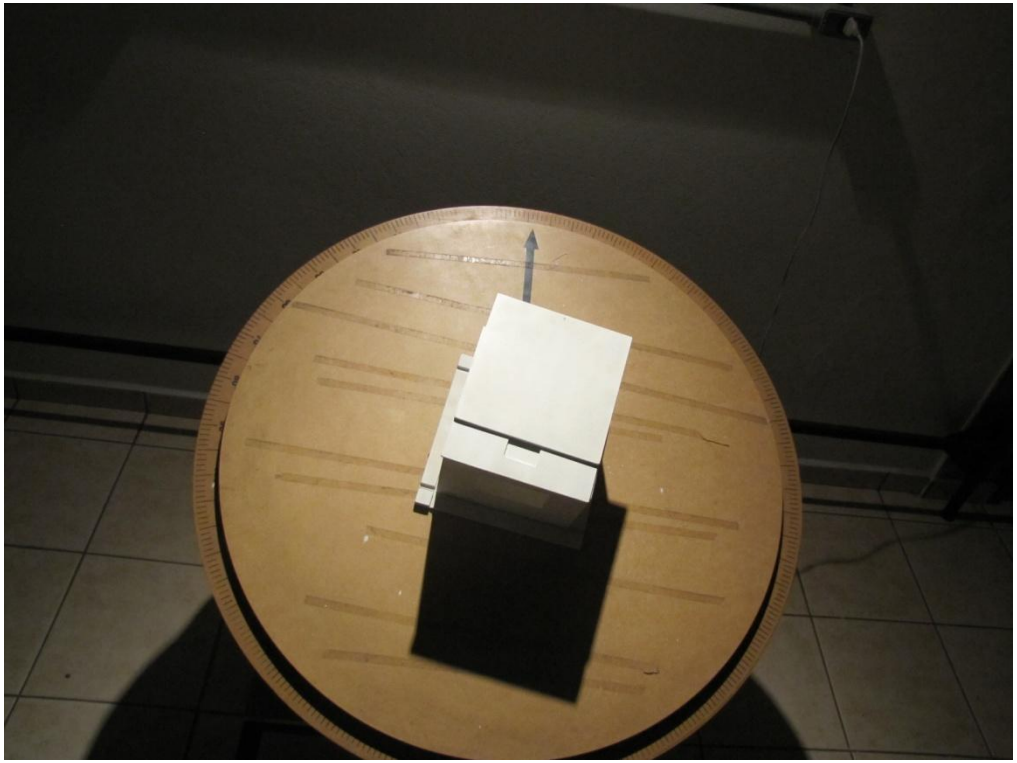
Solstício de Inverno – 10h



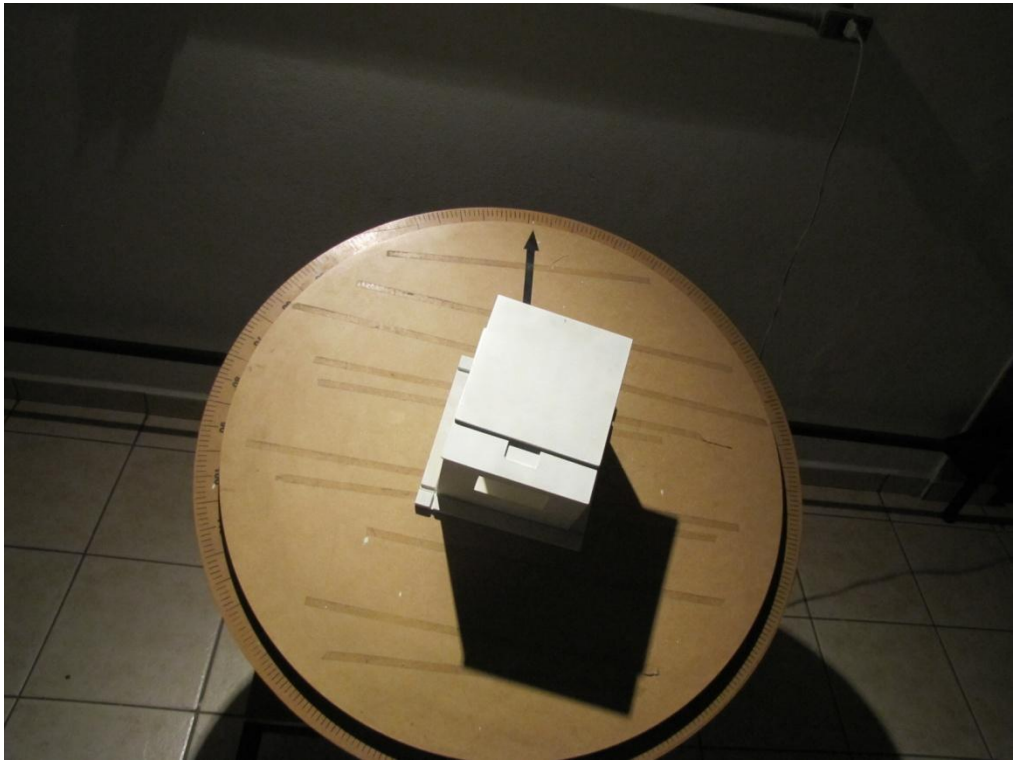
Solstício de Inverno – 11h



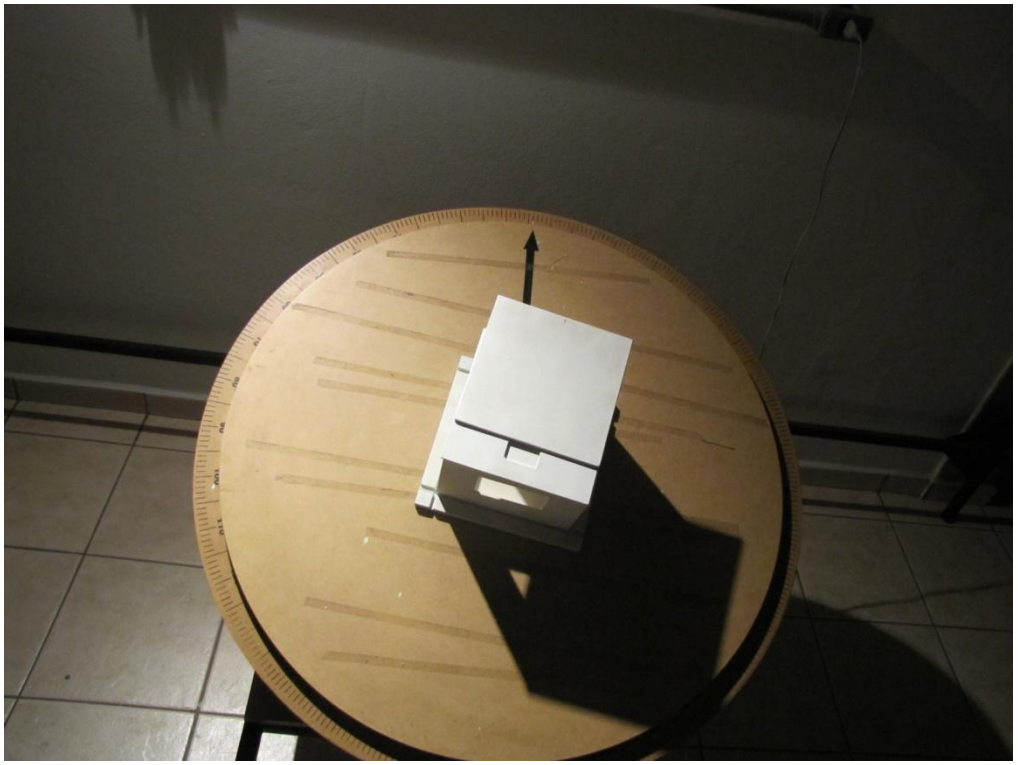
Solstício de Inverno – 12h



Solstício de Inverno – 13h



Solstício de Inverno – 14h



Solstício de Inverno – 15h



Solstício de Inverno – 16h

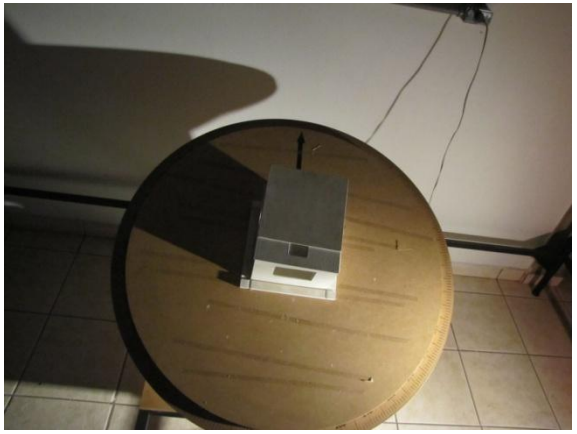
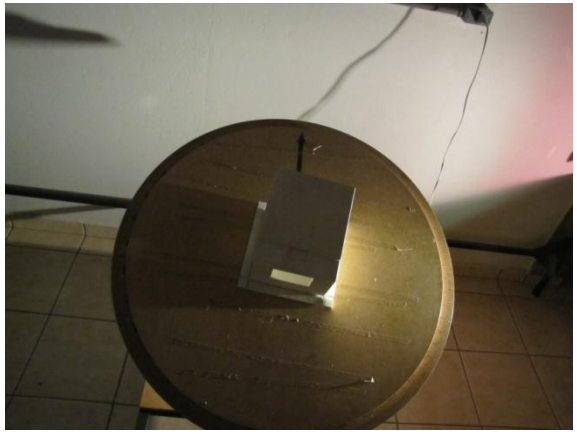
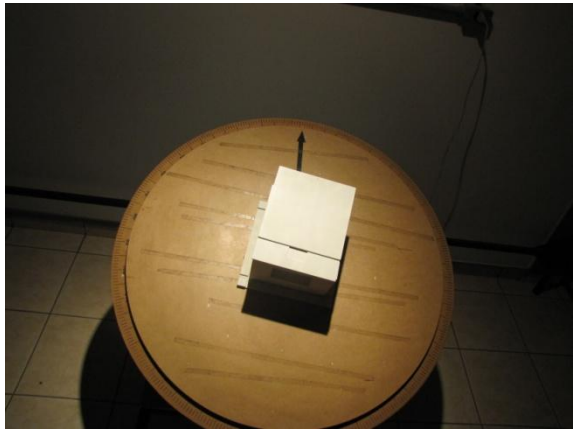
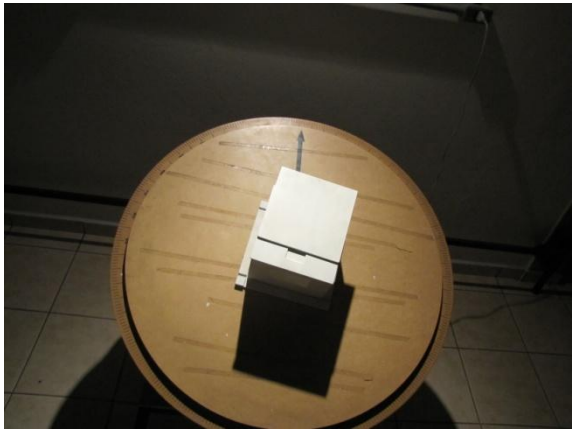


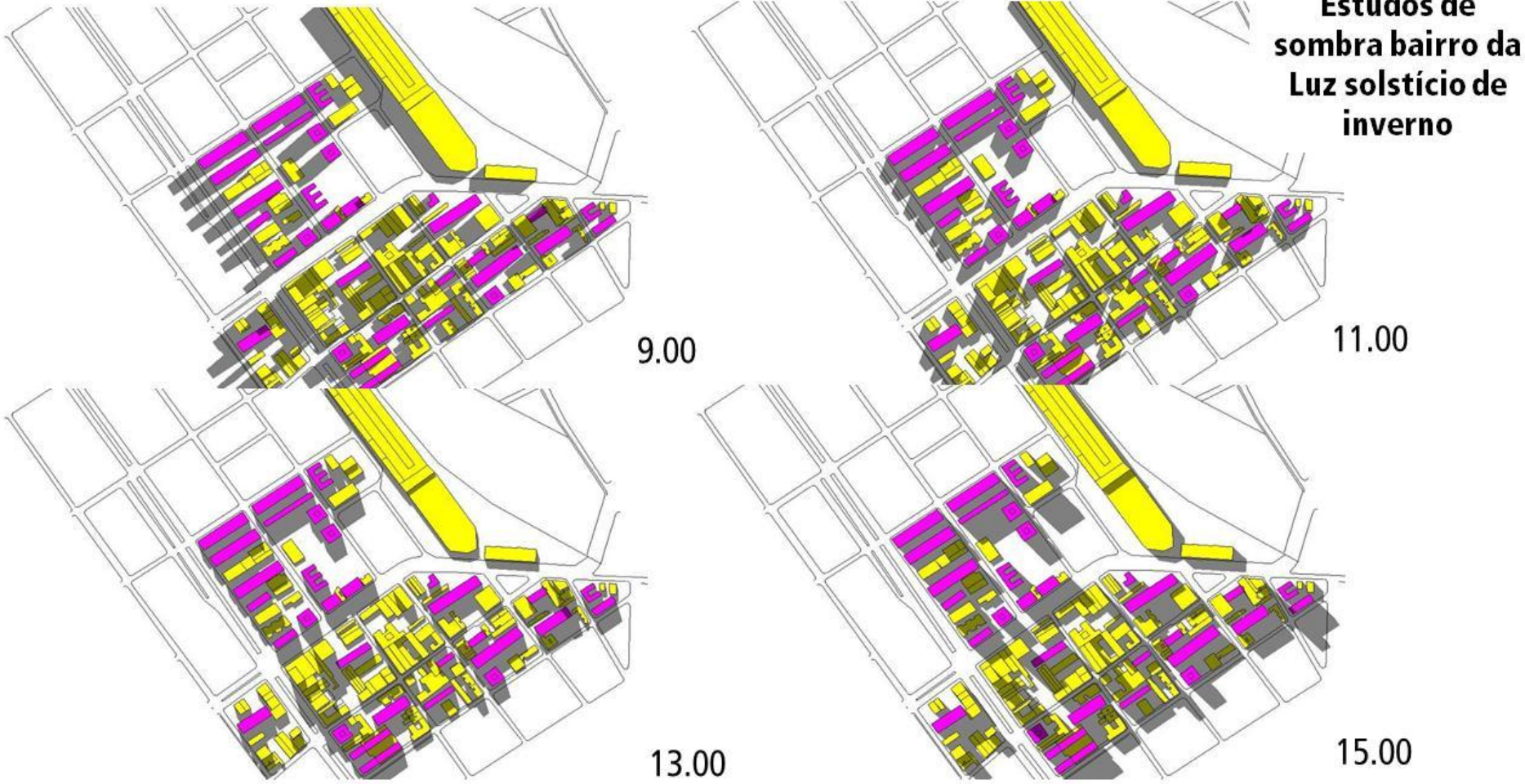
Solstício de Inverno – 17h



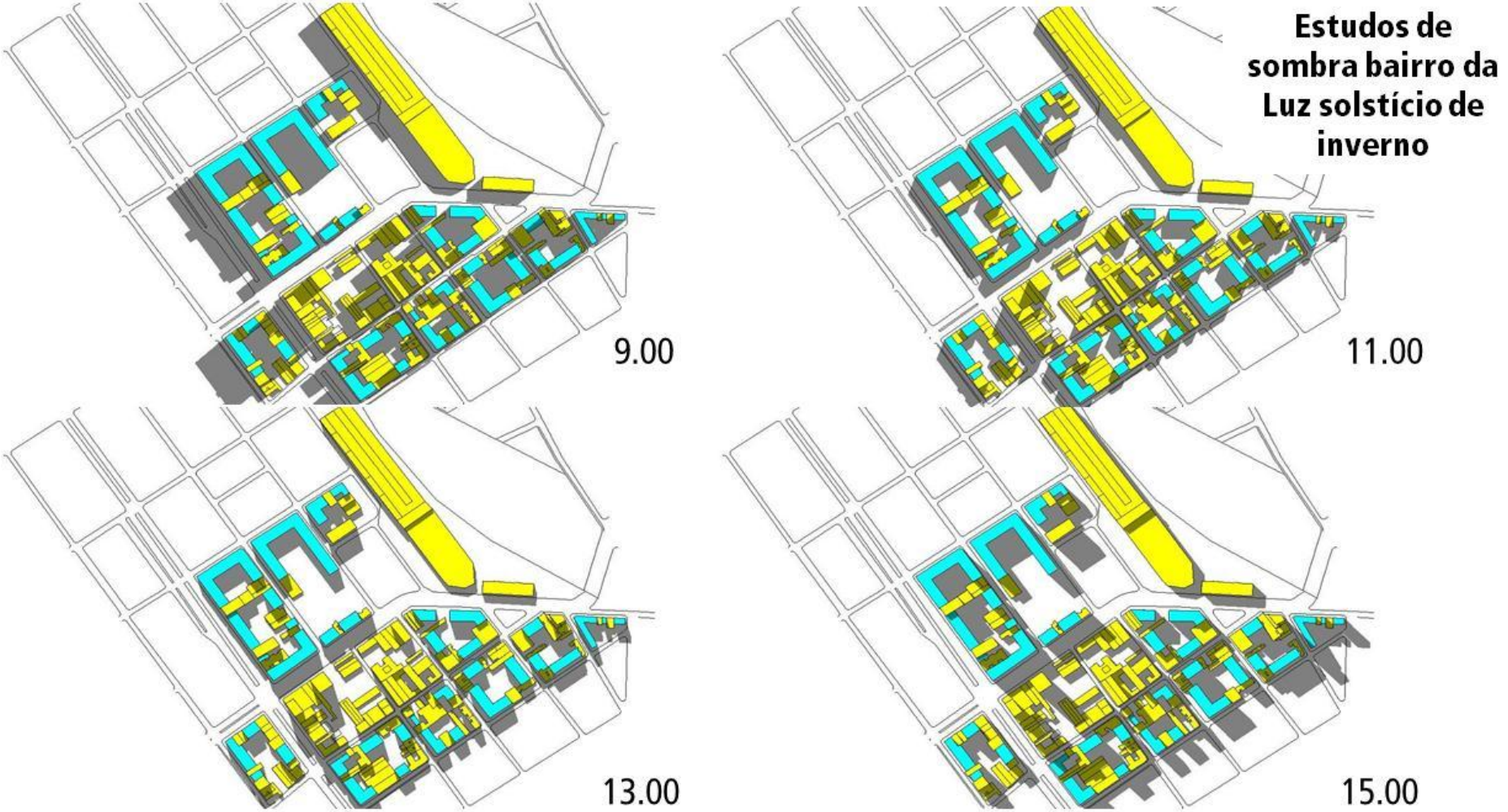
Solstício de Inverno – 18h



	Verão	Primavera / Outono	Inverno
6h			
12h			
18h			



Traçado das sombras



Traçado das sombras