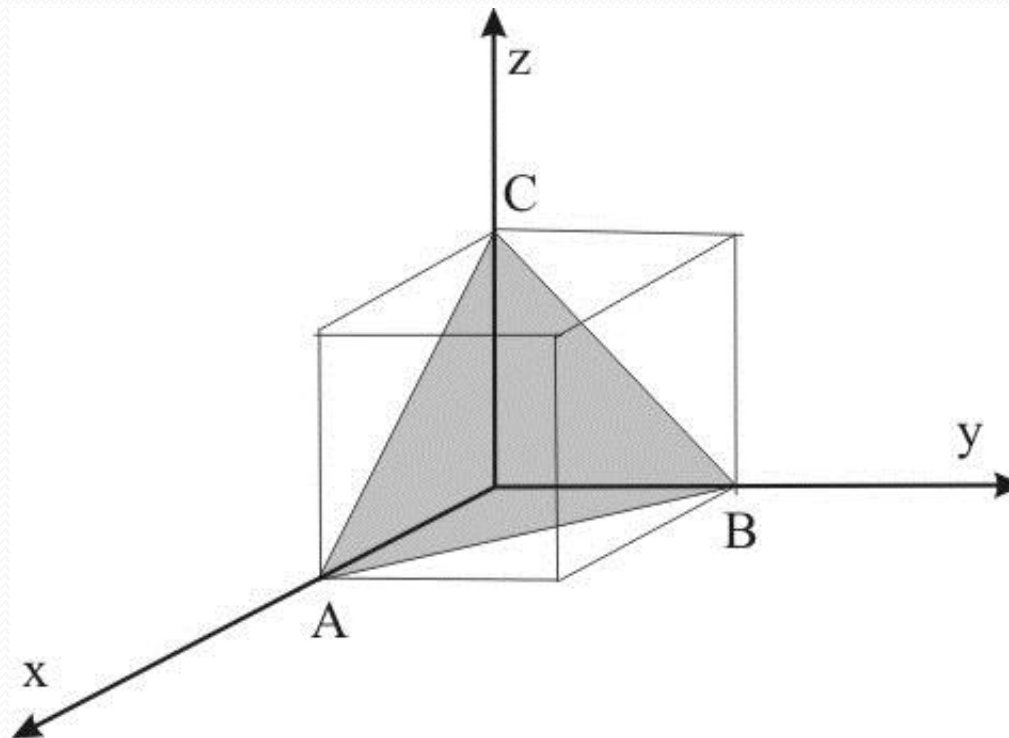


MILEROVI INDEKSI

MILEROVI INDEKSI (h k l)



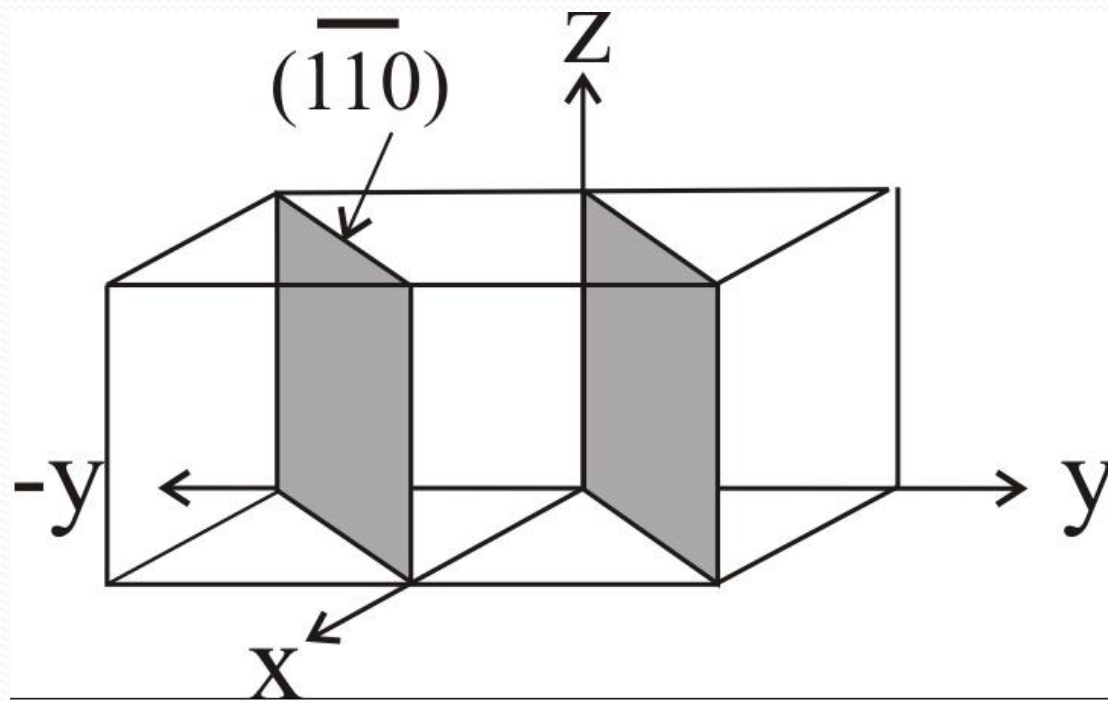
Ravan ABC u koordinatnom sistemu x,y,z.

Određivanje Milerovih indeksa

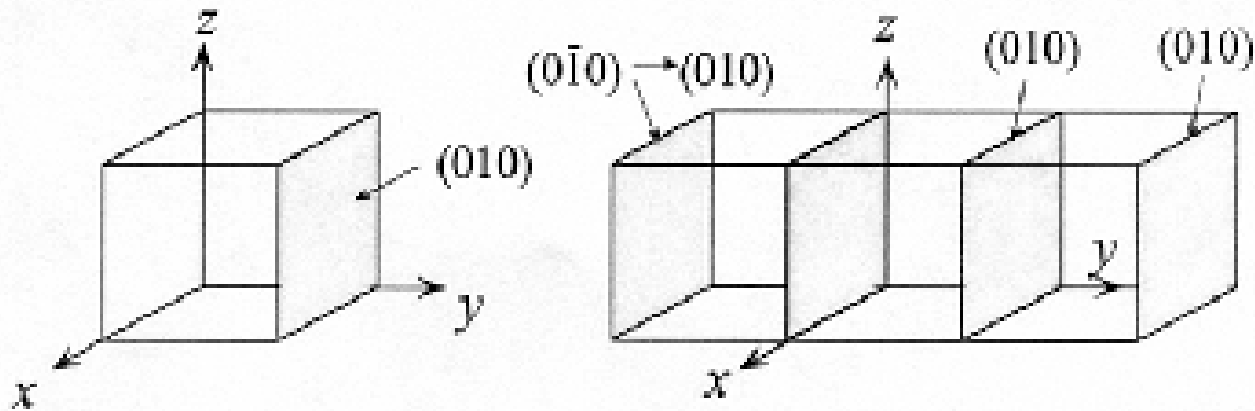
- Odsecci se izraze preko ivica elementarne ćelije $\frac{x}{a}, \frac{y}{b}, \frac{z}{c}$
- Nađu se recipročne vrednosti ovih izraza $\frac{a}{x}, \frac{b}{y}, \frac{c}{z}$
- Nađe se zajednički sadržajoc $n = NZS\left(\frac{x}{a}, \frac{y}{b}, \frac{z}{c}\right)$
- Milerovi indeksi se odrede kao celi brojevi pri čemu se zadržava proporcija odsečaka

$$h = n \cdot \frac{a}{x}, k = n \cdot \frac{b}{y}, l = n \cdot \frac{c}{z}$$

- Ravan koja ne seče neku od koordinatnih osa ima odgovarajući indeks 0.
- Ako ravan seče osu u negativnom delu, indeks je negativan i označava se crticom iznad indeksa, npr. $(h \bar{k} l)$



Sve ravni koje su paralelne i fizički ekvivalentne datoj ravni imaju iste Milerove indekse i takva familija ravni se označava sa $\{h k l\}$



Ako su poznati Milerovi indeksi određuju se odsecci na koordinatnim osama za ravan koja je najbliža koordinatnom početku ($n=1$) :

$$h = \frac{a}{x} \Rightarrow x = \frac{a}{h}$$

$$k = \frac{b}{y} \Rightarrow y = \frac{b}{k}$$

$$l = \frac{c}{z} \Rightarrow z = \frac{c}{l}$$

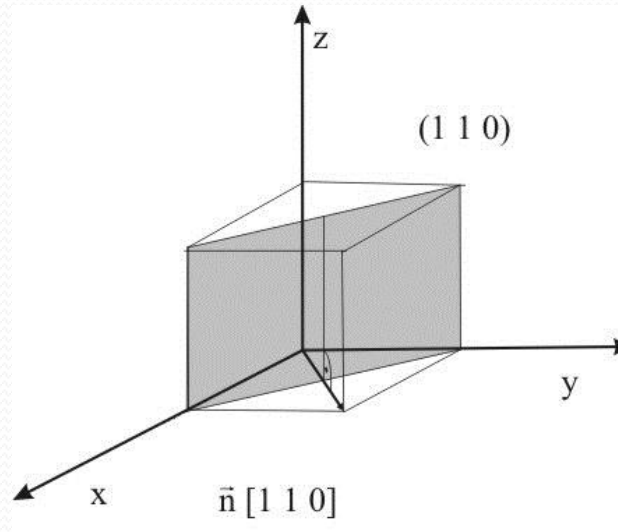
Presek dve kristalografske ravni

Presek dve kristalografske ravni $(h_1 \ k_1 \ l_1)$ i $(h_2 \ k_2 \ l_2)$ označava se simbolima pravca preseka ovih ravni $[r \ s \ t]$, gde je:

$$r = k_1 l_2 - k_2 l_1 \qquad s = l_1 h_2 - l_2 h_1 \qquad t = h_1 k_2 - h_2 k_1$$

$$\begin{array}{c} h_1 \left| k_1 \right. l_1 \\ h_2 \left| k_2 \right. l_2 \end{array} \quad \begin{array}{c} h_1 \\ h_2 \\ k_1 \\ k_2 \end{array} \quad \begin{array}{c} k_1 \left| l_1 \right. \\ k_2 \left| l_2 \right. \end{array}$$

- Pravac dat Milerovim indeksima [h k l] normalan je na ravan sa istim Milerovim indeksima (h k l).



- Rastojanje između paralelnih ravni označenih Milerovim indeksima (h k l) za prostu kubnu rešetku je:

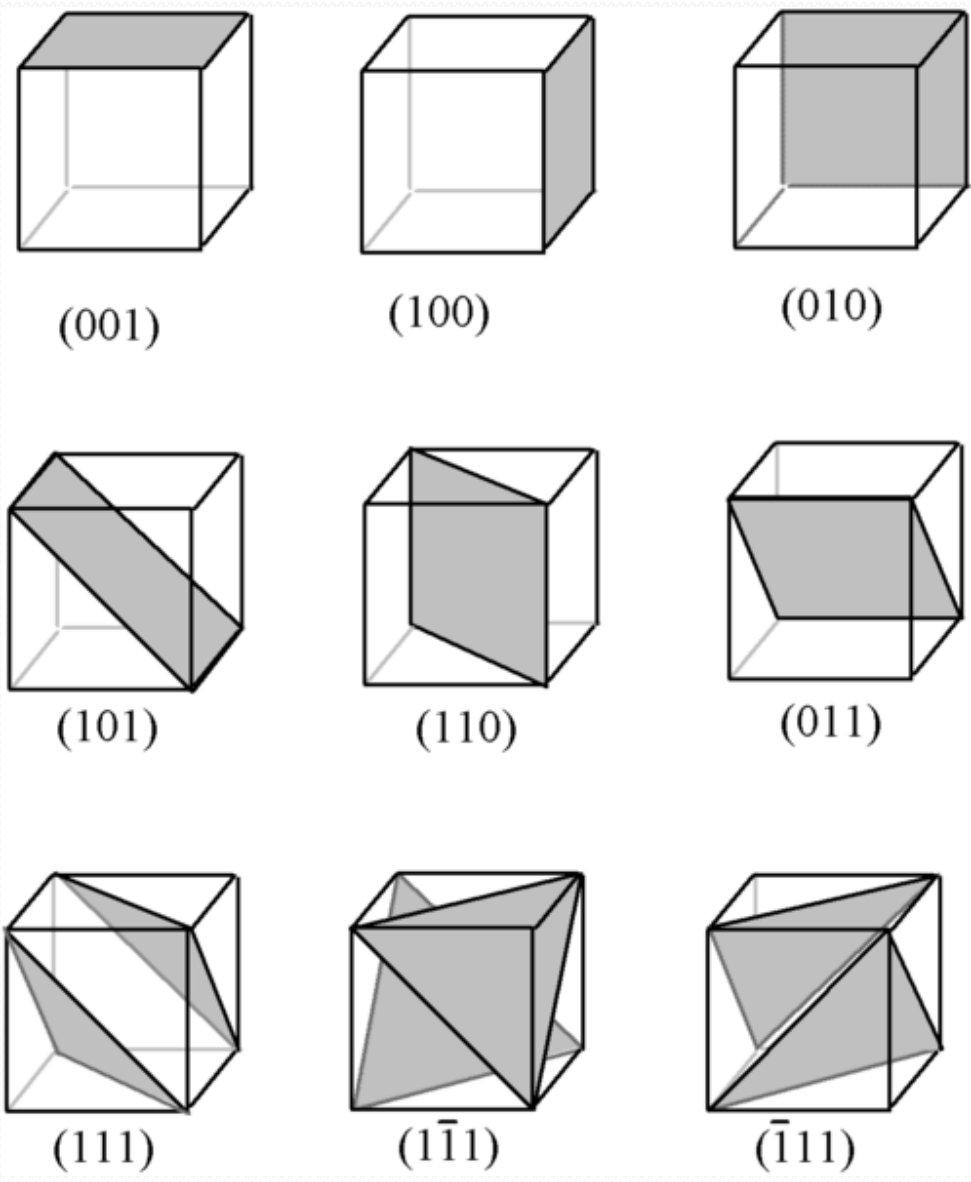
$$d_{(hkl)} = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

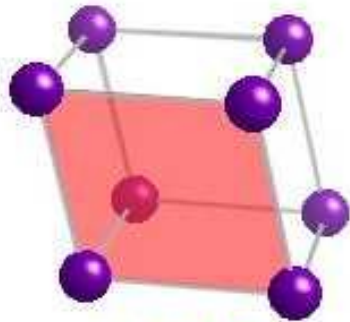
- Površinska koncentracija atoma odnosno gustina atoma po jedinici površine za ravan datu Milerovim indeksima (h k l) je:

$$n_{S(hkl)} = n_v d_{(hkl)}$$

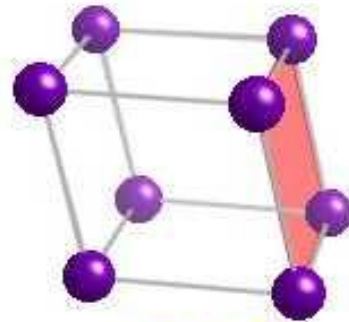
$$n_{S(hkl)} = \frac{n_i}{a^3} \cdot \frac{a}{\sqrt{h^2 + k^2 + l^2}} = \frac{n_i}{a^2 \sqrt{h^2 + k^2 + l^2}}$$

Milerovi indeksi ravni kubne elementarne ćelije

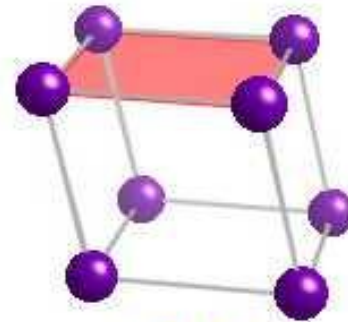




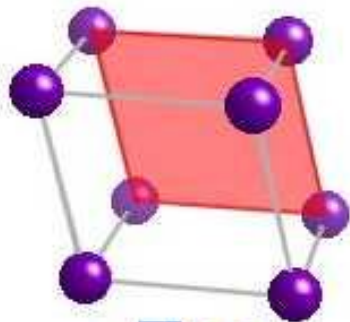
(100)



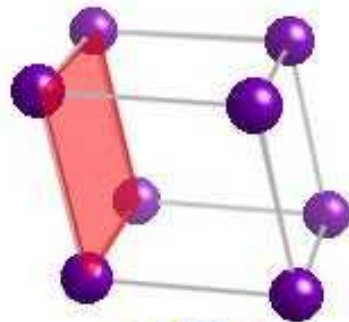
(010)



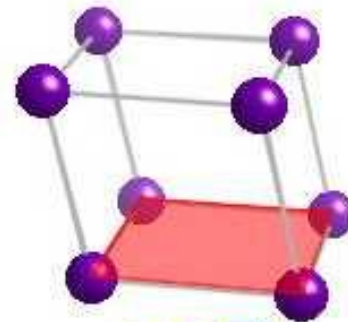
(001)



$(\bar{1}00)$

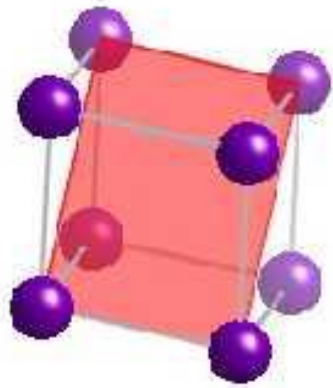


$(0\bar{1}0)$

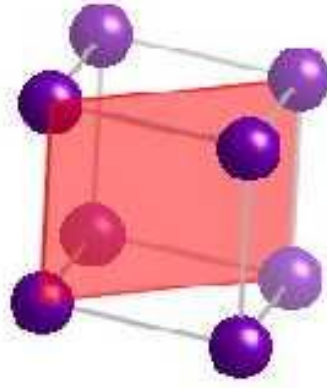


$(00\bar{1})$

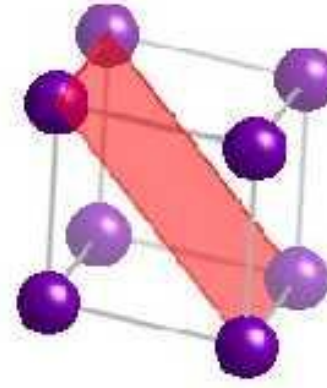




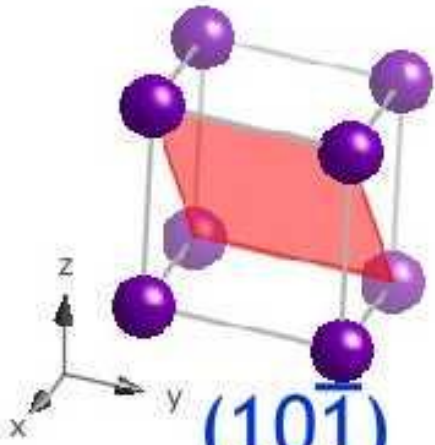
(101)



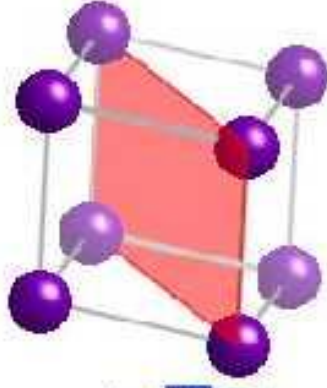
(110)



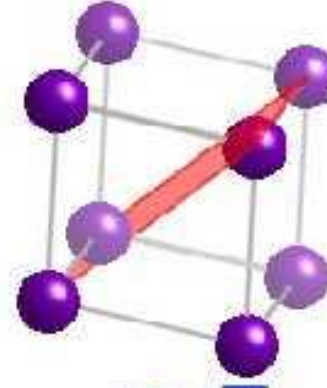
(011)



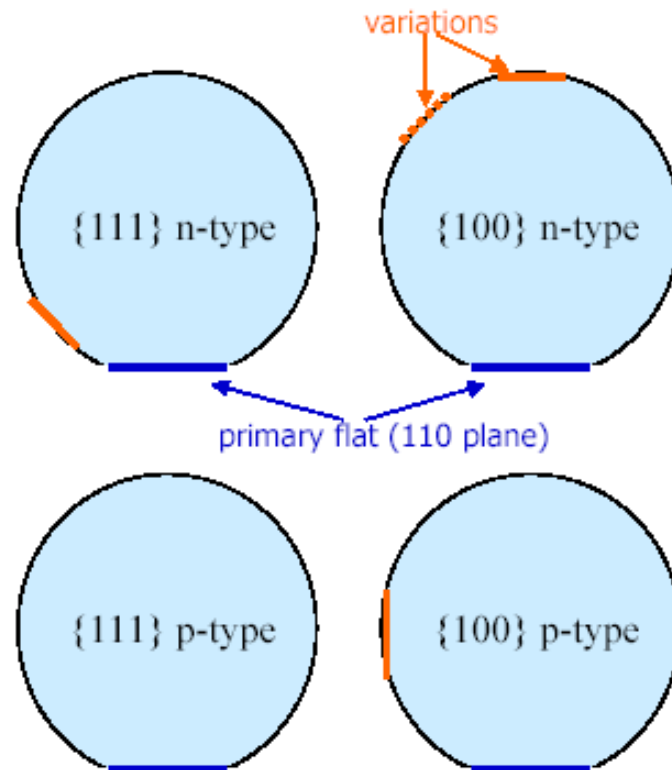
(10 $\bar{1}$)



(1 $\bar{1}$ 0)



(01 $\bar{1}$)



Note **primary** and **secondary** flats.