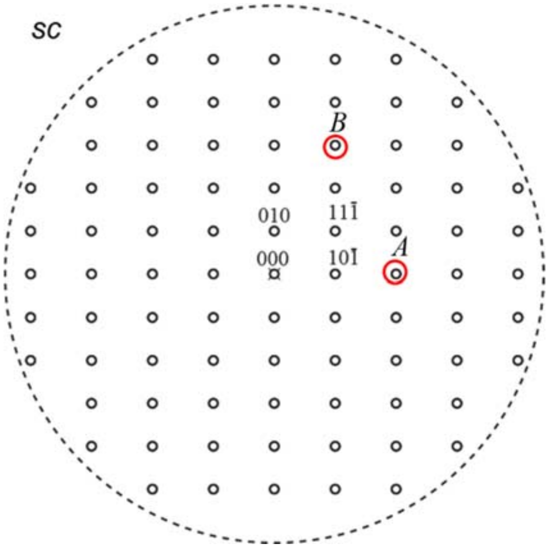
#1:



$\mathbf{g}_1 = (10\bar{1}) - (000) = (10\bar{1})$

$\mathbf{g}_2 = (010) - (000) = (010)$

a)

$$[uvw] \parallel \mathbf{g}_1 \times \mathbf{g}_2 = \begin{vmatrix} \mathbf{a}_1 & \mathbf{a}_2 & \mathbf{a}_3 \\ 1 & 0 & -1 \\ 0 & 1 & 0 \end{vmatrix} = \underline{\underline{[101]}}$$

b)

$$hu + kv + \ell w = N$$

$$h + \ell = N$$

$$1 + (-1) = 0 \rightarrow \underline{\underline{N = 0}}$$

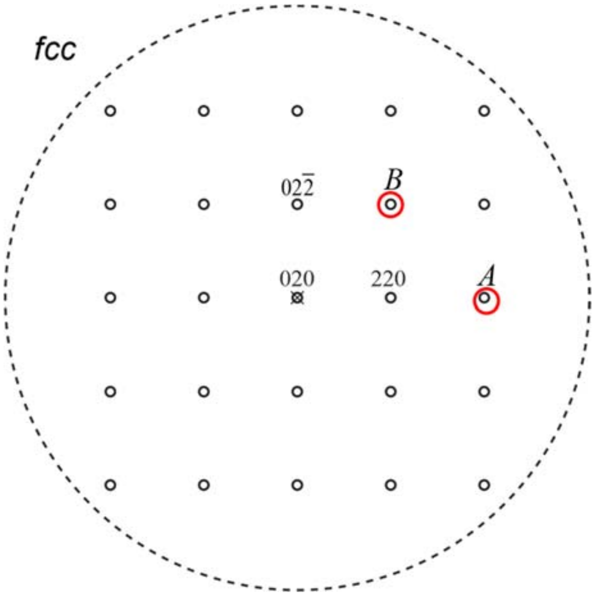
c) $N = 0$ is always $\underline{\underline{\text{ZOLZ}}}$

d)

$$A = 2 \cdot [(10\bar{1}) - (000)] + (000) = \underline{\underline{(20\bar{2})}}$$

$$B = 2 \cdot [(010) - (000)] + (11\bar{1}) = \underline{\underline{(13\bar{1})}}$$

#2



$$\mathbf{g}_1 = (220) - (020) = (200)$$
$$\mathbf{g}_2 = (02\bar{2}) - (020) = (00\bar{2})$$

a)

$$[uvw] \parallel \mathbf{g}_1 \times \mathbf{g}_2 \parallel \begin{vmatrix} \mathbf{a}_1 & \mathbf{a}_2 & \mathbf{a}_3 \\ 1 & 0 & 0 \\ 0 & 0 & \bar{1} \end{vmatrix} = \underline{\underline{[010]}}$$

b)

$$hu + kv + \ell w = N$$
$$k = N$$
$$2 = 2 \rightarrow \underline{\underline{N = 2}}$$

c)

We know $N = 0$ ($k = 0$) is ZOLZ.

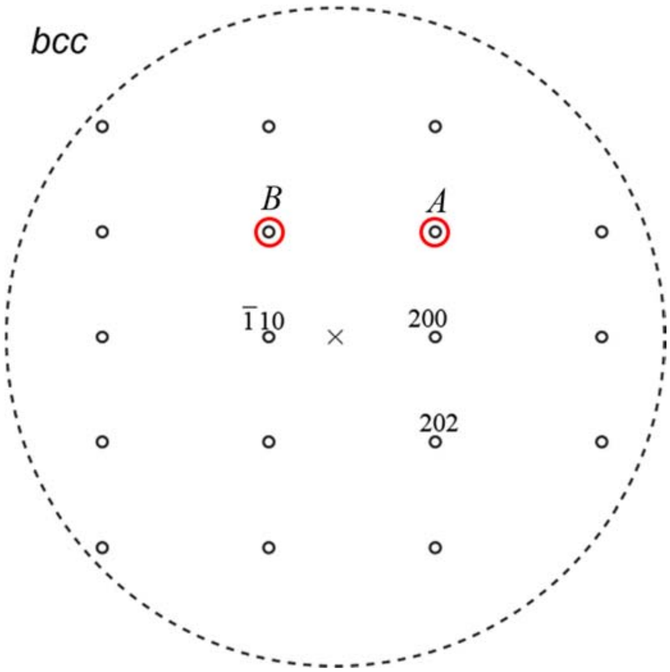
Are there reflections for fcc , $N = 1$ ($k = 1$)? Yes: 111

So, $N = 2$ is the $\underline{\underline{\text{SOLZ}}}$.

d)

$$A = [(220) - (020)] + (220) = \underline{\underline{(420)}}$$
$$B = [(02\bar{2}) - (020)] + (220) = \underline{\underline{(22\bar{2})}}$$

#3



$$\mathbf{g}_1 = (200) - (\bar{1}10) = (3\bar{1}0)$$
$$\mathbf{g}_2 = (200) - (202) = (00\bar{2})$$

a)

$$[uvw] \parallel \mathbf{g}_1 \times \mathbf{g}_2 \parallel \begin{vmatrix} \mathbf{a}_1 & \mathbf{a}_2 & \mathbf{a}_3 \\ 3 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{vmatrix} = \underline{\underline{[130]}}$$

b)

$$hu + kv + \ell w = N$$
$$h + 3k = N$$
$$2 + 3 \cdot 0 = 2 \rightarrow \underline{\underline{N = 2}}$$

c)

We know $N = 0$ ($h + 3k = 0$) is ZOLZ.

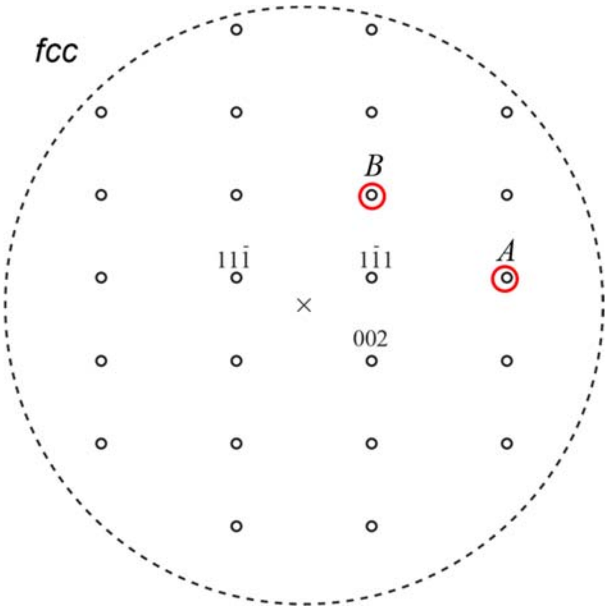
Are there reflections for bcc with $N = 1$ ($h + 3k = 1$)? Yes: $\bar{2}11$

So, $N = 2$ is the $\underline{\underline{\text{SOLZ}}}$.

d)

$$A = [(200) - (202)] + (200) = \underline{\underline{(20\bar{2})}}$$
$$B = [(200) - (202)] + (\bar{1}10) = \underline{\underline{(\bar{1}1\bar{2})}}$$

#4



$$\mathbf{g}_1 = (1\bar{1}1) - (11\bar{1}) = (0\bar{2}2)$$
$$\mathbf{g}_2 = (1\bar{1}1) - (002) = (1\bar{1}\bar{1})$$

a)

$$[uvw] \parallel \mathbf{g}_1 \times \mathbf{g}_2 \parallel \begin{vmatrix} \mathbf{a}_1 & \mathbf{a}_2 & \mathbf{a}_3 \\ 0 & \bar{1} & 1 \\ 1 & \bar{1} & \bar{1} \end{vmatrix} = \underline{\underline{[211]}}$$

b)

$$hu + kv + \ell w = N$$
$$2h + k + \ell = N$$
$$2 \cdot 0 + 0 + 2 = 2 \rightarrow \underline{\underline{N = 2}}$$

$$2h + k + \ell = 2$$

c)

We know $N = 0$ ($2h + k + \ell = 0$) is ZOLZ.

Are there reflections for fcc with $N = 1$ ($2h + k + \ell = 1$)? No (all even/odd)

So, $N = 2$ is the $\underline{\underline{\text{FOLZ}}}$.

d)

$$A = [(1\bar{1}1) - (11\bar{1})] + (1\bar{1}1) = \underline{\underline{(3\bar{1}\bar{1})}}$$
$$B = [(1\bar{1}1) - (002)] + (1\bar{1}1) = \underline{\underline{(2\bar{2}0)}}$$