Effects of structure-parameters:

general:

- lowest band rather weakly effected by periodicity
- interaction of different bands [and thus a design of the properties of at least one band] is only possible, where more than one band is present from start $\rightarrow$ not possible with lowest bands
- the chosing of k_x introduces the boundary-conditions of the problem. If these don't fullfill the same symmetry conditions [$k_x \notin \{0, \frac{2\pi}{a} 0.5\}$] as the structure, above classifications of even/odd modes won't work.
- Degenerate modes returned in general don't have to be orthogonal. They can however be made orthogonal: $|1\rangle, |2\rangle$ [normalized: $\langle 1 | 1 \rangle = 1$, $\langle 2 | 2 \rangle = 1$] $\rightarrow$ $|1'\rangle = |1\rangle$, $|2'\rangle = \frac{1}{\sqrt{1+\langle 1 | 2 \rangle^2}} \left[|2\rangle - \langle 1 | 2 \rangle |1\rangle \right]$. [Gram-Schmidt] MPB should return orthonormal modes. They however can be arbitrary superpositions of the "real" modes [which do fulfill the symmetry-conditions].
- interacting bands are not moving past each other [while changing geometric parameters], but repell each other and exchange ther fields in that process. [why???]

`nSub`:

- bigger n_{Sub} shifts the bands downward [higher n_{eff}]; note that different modes are affected differently [the stronger the modes are confined in z-direction [lower order], the weaker the effect]
- breaks z-symmetry and leads to an anticrossing where z-even and z-odd modes crossed [the crossing point however shifts at the same time; see above]

`dcenter`:

- bigger d_{center} leads to a stronger confinement in y-direction in the center waveguide $\rightarrow$ lower bands [bigger n_{eff}] and weaker interaction with the outer WGs
- E_y [TE] sees a stronger coupling to the outer WGs for bigger d_{center} compared to E_z [TM]

`dside`:

- `dside` bigger $\rightarrow$ stronger confined outer-WG modes, lower bands, weaker periodicity-effects

`GuidesDeltaY`:

- the smaller `GuidesDeltaY`, the stronger the coupling to the outer WGs [for lower bands typically higher n_{eff} $\Leftrightarrow$ lower bands]
- for other bands a stronger coupling might lead to more field in between the guides or the holes of the outer WGs $\Rightarrow$ lower n_{eff} [higher bands]

`hcenter`:

- for `dcenter`$= 0.9$, `hcenter`< 0.8 no band under the light-line of SiO_2 for the center WG.
- the bigger `hcenter`, the lower the bands [of the center WG]
- the bigger `hcenter`, the weaker the interaction of the center WG modes with the periodicity of the outer WGs
- -> look at field profiles [transformation of interacting modes instead of simple passing...]

`hside`:

- bigger `hside` $\rightarrow$ outer-WG bands down, periodicity however not as strongly affected as by varying `dside`
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`HolesDeltaX`:

- breaks y-symmetry and thus [measurably] couples crossing bands with the same dominant field-component and opposite y-symmetry.
- for `HolesDeltaX=` 0.5 and $k_x = 0.5\frac{2\pi}{a}$ x-mirror-symmetry is fullfilled → even- / odd-modes exist [which don't couple!]
  If the outer waveguides are identical apart from the shift of the holes, the two different x-symmetric modes are going to be degenerate at the band-edge.
- by shifting the holes one not only breaks the y-symmetry, but also the x-symmetry at the same time [`HolesDeltaX` $\notin \{0, 0.5\}$ - note that for $k_x \notin \{0, \frac{1}{2}\}\frac{2\pi}{a}$ the fields won't fulfill any x-symmetry anyway].x