1D grid of 1D blocks

```
__device__ int getGlobalIdx_1D_1D()
{
        return blockIdx.x *blockDim.x + threadIdx.x;
}
```

1D grid of 2D blocks

```
__device__ int getGlobalIdx_1D_2D()
{
        return blockIdx.x * blockDim.x * blockDim.y + threadIdx.y * blockDim.x + threadIdx.x;
}
```

1D grid of 3D blocks

```
__device__ int getGlobalIdx_1D_3D()
{
        return blockIdx.x * blockDim.x * blockDim.y * blockDim.z
         + threadIdx.z * blockDim.y * blockDim.x + threadIdx.y * blockDim.x + threadIdx.x;
}
```

2D grid of 1D blocks

```
__device__ int getGlobalIdx_2D_1D()
{
        int blockId   = blockIdx.y * gridDim.x + blockIdx.x;
        int threadId = blockId * blockDim.x + threadIdx.x;
        return threadId;
}
```

2D grid of 2D blocks

```
 __device__ int getGlobalIdx_2D_2D()
{
        int blockId = blockIdx.x + blockIdx.y * gridDim.x;
        int threadId = blockId * (blockDim.x * blockDim.y) + (threadIdx.y * blockDim.x) + threadIdx.x;
        return threadId;
}
```

2D grid of 3D blocks

```
__device__ int getGlobalIdx_2D_3D()
{
        int blockId = blockIdx.x
                        + blockIdx.y * gridDim.x;
        int threadId = blockId * (blockDim.x * blockDim.y * blockDim.z)
                          + (threadIdx.z * (blockDim.x * blockDim.y))
                          + (threadIdx.y * blockDim.x)
                          + threadIdx.x;
        return threadId;
}
```

3D grid of 1D blocks

```
__device__ int getGlobalIdx_3D_1D()
{
        int blockId = blockIdx.x
                        + blockIdx.y * gridDim.x
                        + gridDim.x * gridDim.y * blockIdx.z;
        int threadId = blockId * blockDim.x + threadIdx.x;
        return threadId;
}
```

3D grid of 2D blocks

```
__device__ int getGlobalIdx_3D_2D()
{
        int blockId = blockIdx.x
                      + blockIdx.y * gridDim.x
                        + gridDim.x * gridDim.y * blockIdx.z;
        int threadId = blockId * (blockDim.x * blockDim.y)
                         + (threadIdx.y * blockDim.x)
                         + threadIdx.x;
        return threadId;
}
```

3D grid of 3D blocks

```
__device__ int getGlobalIdx_3D_3D()
{
        int blockId = blockIdx.x
                        + blockIdx.y * gridDim.x
                        + gridDim.x * gridDim.y * blockIdx.z;
        int threadId = blockId * (blockDim.x * blockDim.y * blockDim.z)
                         + (threadIdx.z * (blockDim.x * blockDim.y))
                         + (threadIdx.y * blockDim.x)
                         + threadIdx.x;
        return threadId;
}
```