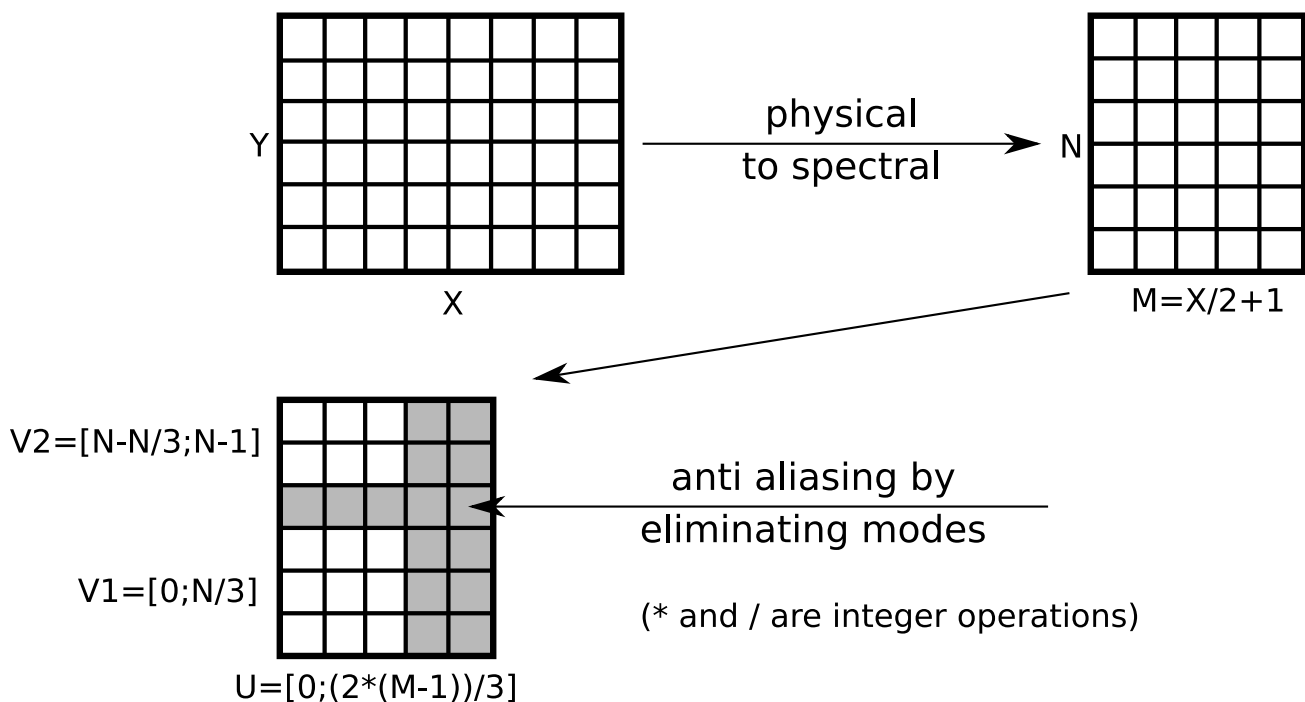# Anti-aliasing strategy in SWEET

This single page describes the anti-aliasing strategy in SWEET.
The underlying idea is based on the anti-aliasing strategies using spherical harmonics.
Here, transformations from physical space of resolution (X,Y) to spectral space (N,M) are supported. There are only one forward/backward spectral transformations used.
We resemble the same strategy for the plane.
More information is available in
doc/software_development_discussions/implementation_plane_and_sphere_data.lyx

The idea is to use a FFT which spectral space is as large as the physical space and then ignore the zero modes.

Another care has to be taken on the real-to-complex transformation:
We only require almost half the storage space in spectral space. The corresponding transformation is outlined as follows

Y ⟶ X

physical
to spectral

N

M=X/2+1

V2=[N-N/3;N-1]

anti aliasing by
eliminating modes

(* and / are integer operations)

V1=[0;N/3]

U=[0;(2*(M-1))/3]

U, V1, V2: ranges for keeping the frequencies

For mul and div operations, the strategy s to zero out the grey modes.

For all other operations, the strategy is to iterate only over the U x [V1,V2] ranges