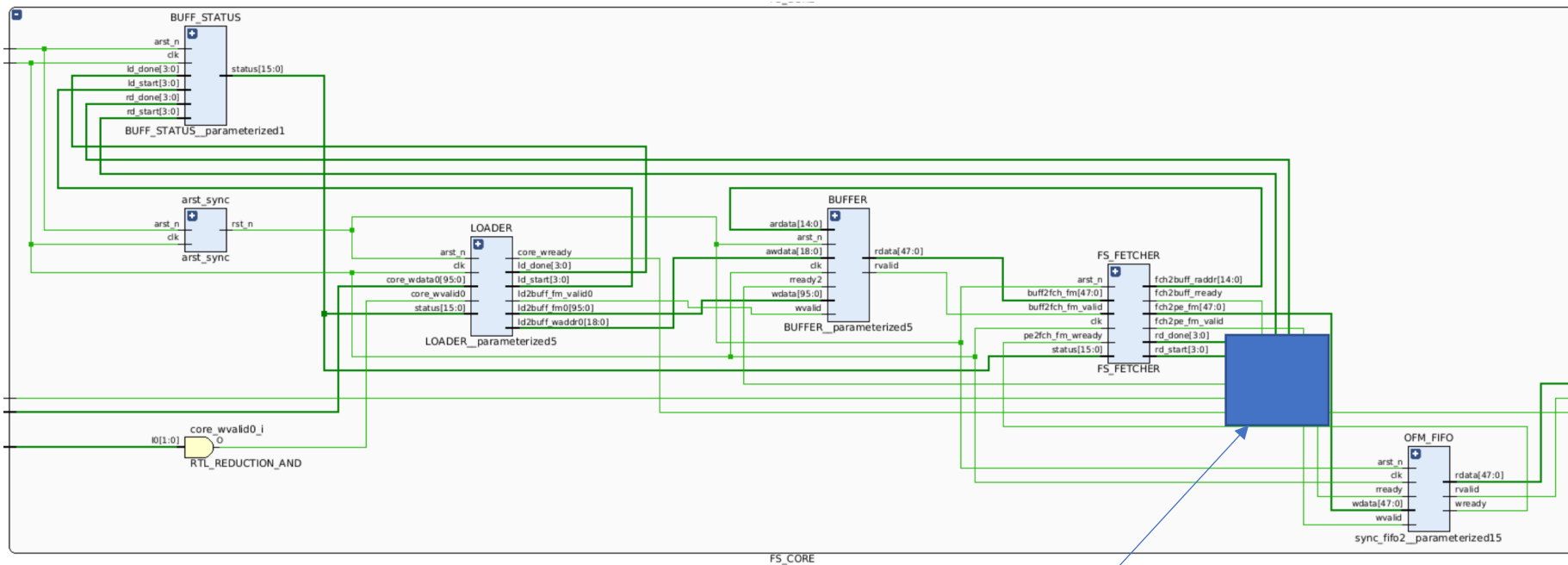


# Sampling & interpolation

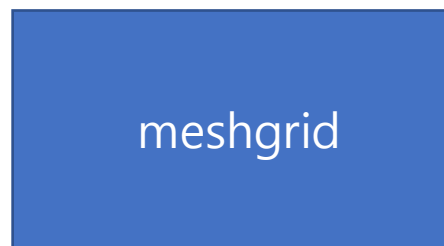


frame  
Synthesis  
module

# frame Synthesis module

cal flow  
annel

Input  
frame

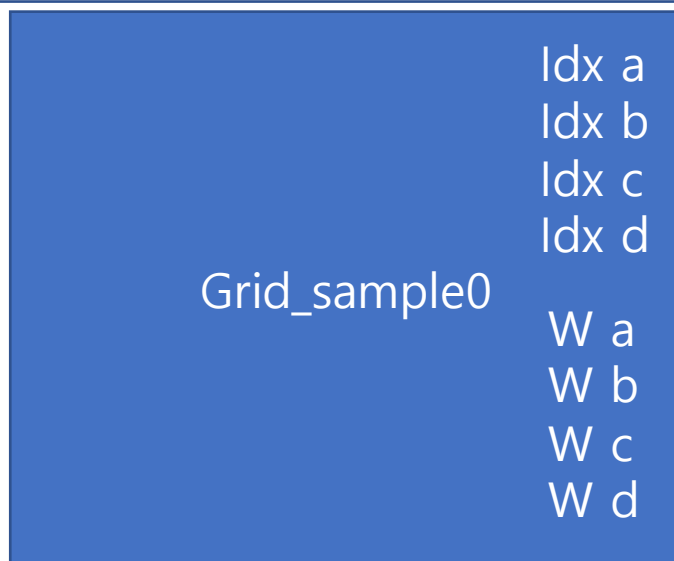


grid\_x  
grid\_y

$\text{coor\_x\_1} = \text{grid\_x} - \text{flow}[0] * 0.5$   
 $\text{coor\_y\_1} = \text{grid\_y} - \text{flow}[1] * 0.5$   
 $\text{coor\_x\_2} = \text{grid\_x} + \text{flow}[0] * 0.5$   
 $\text{coor\_y\_2} = \text{grid\_y} + \text{flow}[1] * 0.5$

FIFO

$\text{Mask} = 0.5 * (1.0 + \text{mask})$



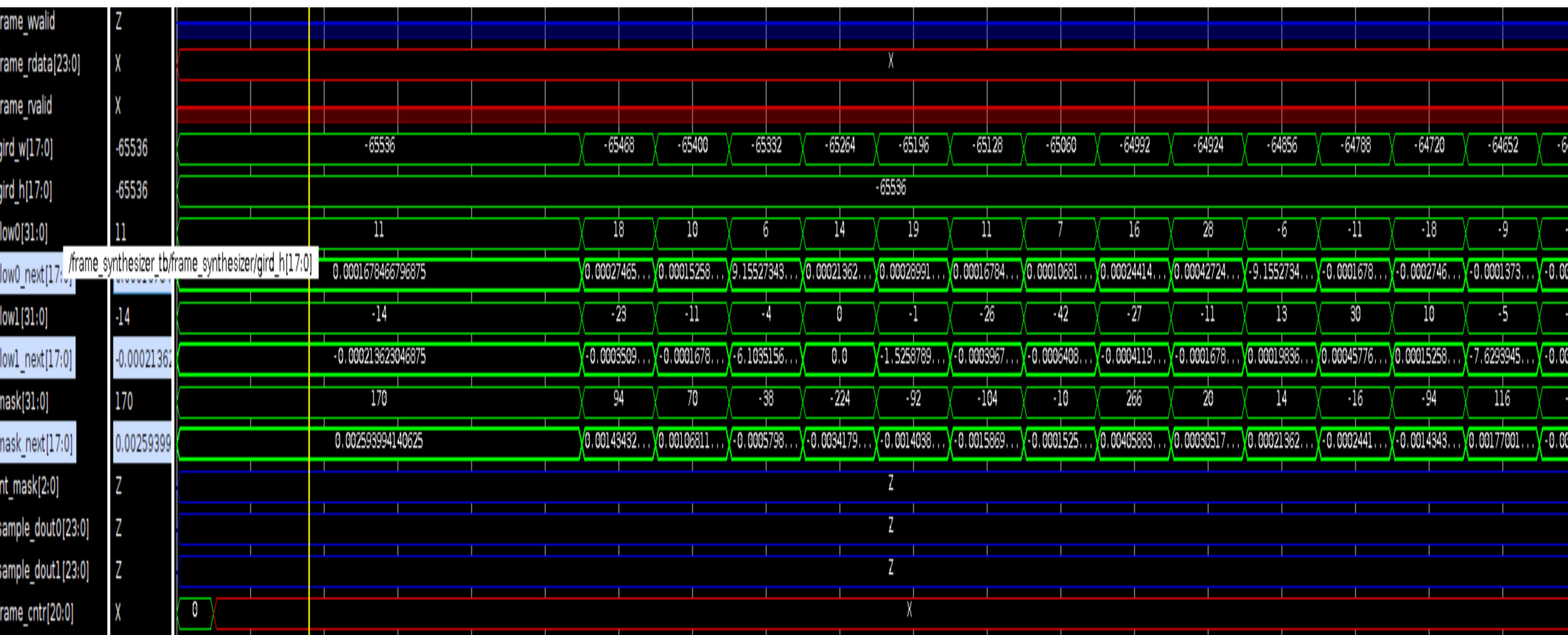
$\text{output\_B}[i] = \text{uchar}(\text{img\_B}[\text{idx\_a}[i]] * \text{wa}[i] + \text{img\_B}[\text{idx\_b}[i]] * \text{wb}[i] + \text{img\_B}[\text{idx\_c}[i]] * \text{wc}[i] + \text{img\_B}[\text{idx\_d}[i]] * \text{wd}[i]);$   
 $\text{output\_G}[i] = \text{uchar}(\text{img\_G}[\text{idx\_a}[i]] * \text{wa}[i] + \text{img\_G}[\text{idx\_b}[i]] * \text{wb}[i] + \text{img\_G}[\text{idx\_c}[i]] * \text{wc}[i] + \text{img\_G}[\text{idx\_d}[i]] * \text{wd}[i]);$   
 $\text{output\_R}[i] = \text{uchar}(\text{img\_R}[\text{idx\_a}[i]] * \text{wa}[i] + \text{img\_R}[\text{idx\_b}[i]] * \text{wb}[i] + \text{img\_R}[\text{idx\_c}[i]] * \text{wc}[i] + \text{img\_R}[\text{idx\_d}[i]] * \text{wd}[i]);$

Grid\_sample1

$\text{output\_B}[i] = \text{uchar}(\text{img\_B}[\text{idx\_a}[i]] * \text{wa}[i] + \text{img\_B}[\text{idx\_b}[i]] * \text{wb}[i] + \text{img\_B}[\text{idx\_c}[i]] * \text{wc}[i] + \text{img\_B}[\text{idx\_d}[i]] * \text{wd}[i]);$   
 $\text{output\_G}[i] = \text{uchar}(\text{img\_G}[\text{idx\_a}[i]] * \text{wa}[i] + \text{img\_G}[\text{idx\_b}[i]] * \text{wb}[i] + \text{img\_G}[\text{idx\_c}[i]] * \text{wc}[i] + \text{img\_G}[\text{idx\_d}[i]] * \text{wd}[i]);$   
 $\text{output\_R}[i] = \text{uchar}(\text{img\_R}[\text{idx\_a}[i]] * \text{wa}[i] + \text{img\_R}[\text{idx\_b}[i]] * \text{wb}[i] + \text{img\_R}[\text{idx\_c}[i]] * \text{wc}[i] + \text{img\_R}[\text{idx\_d}[i]] * \text{wd}[i]);$

$\text{im\_t\_out1} = \text{mask1} * \text{output\_0} + (1.0 - \text{mask1}) * \text{output\_1}$

```
[[ -52708.]]]], grad_fn=<SliceBackward0>)
float_motion0 tensor([[[[ 1.6785e-04,  2.8229e-04,  1.5259e-04,  9.9182e-05,  2.2125e-04,
  2.9755e-04,  1.7548e-04,  1.1444e-04,  2.4414e-04,  4.2725e-04,
 -9.1553e-05, -1.6785e-04, -2.6703e-04, -1.2970e-04, -1.9073e-04,
  1.8311e-04,  2.2888e-04,  3.8910e-04,  3.0518e-04,  3.9673e-04,
  3.4332e-04,  2.6703e-04,  1.6022e-04,  1.4496e-04,  1.6785e-04,
  3.0518e-04,  2.6703e-04,  6.8665e-04,  1.8311e-04, -3.8910e-04,
 -3.0518e-05,  2.2888e-04]]]], grad_fn=<SliceBackward0>)
int_motion0 tensor([[[[ 22.,  37.,  20.,  13.,  29.,  39.,  23.,  15.,  32.,  56., -12.,
 -22., -35., -17., -25.,  24.,  30.,  51.,  40.,  52.,  45.,  35.,
  21.,  19.,  22.,  40.,  35.,  90.,  24., -51., -4.,  30.]]]],
  grad_fn=<SliceBackward0>)
float_motion1 tensor([[[[ -2.1362e-04, -3.5095e-04, -1.6785e-04, -6.1035e-05,  0.0000e+00,
 -1.5259e-05, -3.9673e-04, -6.4087e-04, -4.1199e-04, -1.6785e-04,
  1.9836e-04,  4.5776e-04,  1.5259e-04, -7.6294e-05, -2.4414e-04,
 -2.5940e-04, -4.4250e-04, -6.1035e-04, -3.5095e-04, -9.1553e-05,
 -2.2888e-04, -4.4250e-04, -4.7302e-04, -5.3406e-04, -7.6294e-05,
  2.4414e-04,  4.2725e-04,  7.1716e-04,  1.8311e-04, -2.2888e-04,
 -2.5940e-04, -3.6621e-04]]]], grad_fn=<SliceBackward0>)
int_motion1 tensor([[[[ -14., -23., -11., -4.,  0., -1., -26., -42., -27., -11.,  13.,
  30.,  10., -5., -16., -17., -29., -40., -23., -6., -15., -29.,
 -31., -35., -5.,  16.,  28.,  47.,  12., -15., -17., -24.]]]],
  grad_fn=<SliceBackward0>)
float_motion2 tensor([[[[ 2.5940e-03,  1.4343e-03,  1.0681e-03, -5.7983e-04, -3.4180e-03,
 -1.4038e-03, -1.5869e-03, -1.5259e-04,  4.0588e-03,  3.0518e-04,
  2.1362e-04, -2.4414e-04, -1.4343e-03,  1.7700e-03, -3.3569e-04,
 -9.1553e-04,  3.1128e-03,  1.4343e-03, -2.2583e-03, -2.9297e-03,
 -2.0752e-03, -6.1035e-04, -2.2583e-03, -1.8616e-03,  9.4604e-04,
 -1.7395e-03, -8.7891e-03, -6.6223e-03, -5.1575e-03,  3.0518e-05,
 -9.1553e-05, -1.5869e-03]]]], grad_fn=<SliceBackward0>)
int_motion2 tensor([[[[ 85.,  47.,  35., -19., -112., -46., -52., -5.,  133.,  10.,
  7., -8., -47.,  58., -11., -30.,  102.,  47., -74., -96.,
 -68., -20., -74., -61.,  31., -57., -288., -217., -169.,  1.,
 -3., -52.]]]], grad_fn=<SliceBackward0>)
diff tensor(0.0071, dtype=torch.float64, grad_fn=<MaxBackward1>)
diff tensor(0.0070, dtype=torch.float64, grad_fn=<MaxBackward1>)
```



```

[[ 32768.]]], grad_fn=<MulBackward0>)
float_motion0 tensor([[[[ 1.6785e-04,  2.8229e-04,  1.5259e-04,  9.9182e-05,  2.2125e-04,
    2.9755e-04,  1.7548e-04,  1.1444e-04,  2.4414e-04,  4.2725e-04,
   -9.1553e-05, -1.6785e-04, -2.6703e-04, -1.2970e-04, -1.9073e-04,
    1.8311e-04,  2.2888e-04,  3.8910e-04,  3.0518e-04,  3.9673e-04,
    3.4332e-04,  2.6703e-04,  1.6022e-04,  1.4496e-04,  1.6785e-04,
    3.0518e-04,  2.6703e-04,  6.8665e-04,  1.8311e-04, -3.8910e-04,
   -3.0518e-05,  2.2888e-04]]]], grad_fn=<SliceBackward>)
int_motion0 tensor([[[[ 22.,  37.,  20.,  13.,  29.,  39.,  23.,  15.,  32.,  56., -12.,
  -22., -35., -17., -25.,  24.,  30.,  51.,  40.,  52.,  45.,  35.,
   21.,  19.,  22.,  40.,  35.,  90.,  24., -51., -4.,  30.]]]],
  grad_fn=<SliceBackward>)
float_motion1 tensor([[[[ -2.1362e-04, -3.5095e-04, -1.6785e-04, -6.1035e-05,  0.0000e+00,
  -1.5259e-05, -3.9673e-04, -6.4087e-04, -4.1199e-04, -1.6785e-04,
   1.9836e-04,  4.5776e-04,  1.5259e-04, -7.6294e-05, -2.4414e-04,
  -2.5940e-04, -4.4250e-04, -6.1035e-04, -3.5095e-04, -9.1553e-05,
  -2.2888e-04, -4.4250e-04, -4.7302e-04, -5.3406e-04, -7.6294e-05,
   2.4414e-04,  4.2725e-04,  7.1716e-04,  1.8311e-04, -2.2888e-04,
  -2.5940e-04, -3.6621e-04]]]], grad_fn=<SliceBackward>)
int_motion1 tensor([[[[ -14., -23., -11., -4.,  0., -1., -26., -42., -27., -11.,  13.,
   30.,  10., -5., -16., -17., -29., -40., -23., -6., -15., -29.,
  -31., -35., -5.,  16.,  28.,  47.,  12., -15., -17., -24.]]]],
  grad_fn=<SliceBackward>)
float_motion2 tensor([[[[ 2.5940e-03,  1.4343e-03,  1.0681e-03, -5.7983e-04, -3.4180e-03,
  -1.4038e-03, -1.5869e-03, -1.5259e-04,  4.0588e-03,  3.0518e-04,
   2.1362e-04, -2.4414e-04, -1.4343e-03,  1.7700e-03, -3.3569e-04,
  -9.1553e-04,  3.1128e-03,  1.4343e-03, -2.2583e-03, -2.9297e-03,
  -2.0752e-03, -6.1035e-04, -2.2583e-03, -1.8616e-03,  9.4604e-04,
  -1.7395e-03, -8.7891e-03, -6.6223e-03, -5.1575e-03,  3.0518e-05,
  -9.1553e-05, -1.5869e-03]]]], grad_fn=<SliceBackward>)
int_motion2 tensor([[[[ 85.,  47.,  35., -19., -112., -46., -52., -5.,  133.,  10.,
   7., -8., -47.,  58., -11., -30.,  102.,  47., -74., -96.,
  -68., -20., -74., -61.,  31., -57., -288., -217., -169.,  1.,
   -3., -52.]]]], grad_fn=<SliceBackward>)
float_motion0 * 0.5 tensor([[[[ 8.3923e-05,  1.4114e-04,  7.6294e-05,  4.9591e-05,  1.1063e-04,
   1.4877e-04,  8.7738e-05,  5.7220e-05,  1.2207e-04,  2.1362e-04,
  -4.5776e-05, -8.3923e-05, -1.3351e-04, -6.4850e-05, -9.5367e-05,
   9.1553e-05,  1.1444e-04,  1.9455e-04,  1.5259e-04,  1.9836e-04,
   1.7166e-04,  1.3351e-04,  8.0109e-05,  7.2479e-05,  8.3923e-05,
   1.5259e-04,  1.3351e-04,  3.4332e-04,  9.1553e-05, -1.9455e-04,
  -1.5259e-05,  1.1444e-04]]]], grad_fn=<SliceBackward>)
float_motion1* 0.5 tensor([[[[ -1.0681e-04, -1.7548e-04, -8.3923e-05, -3.0518e-05,  0.0000e+00,
  -7.6294e-06, -1.9836e-04, -3.2043e-04, -2.0599e-04, -8.3923e-05,
   9.9182e-05,  2.2888e-04,  7.6294e-05, -3.8147e-05, -1.2207e-04,
  -1.2970e-04, -2.2125e-04, -3.0518e-04, -1.7548e-04, -4.5776e-05,
  -1.1444e-04, -2.2125e-04, -2.3651e-04, -2.6703e-04, -3.8147e-05,
   1.2207e-04,  2.1362e-04,  3.5858e-04,  9.1553e-05, -1.1444e-04,
  -1.2970e-04, -1.8311e-04]]]], grad_fn=<SliceBackward>)
float_motion2* 0.5 tensor([[[[ 0.5013, 0.5007, 0.5005, 0.4997, 0.4983, 0.4993, 0.4992, 0.4999,
   0.5020, 0.5002, 0.5001, 0.4999, 0.4993, 0.5009, 0.4998, 0.4995,
   0.5016, 0.5007, 0.4989, 0.4985, 0.4990, 0.4997, 0.4989, 0.4991,
   0.5005, 0.4991, 0.4956, 0.4967, 0.4974, 0.5000, 0.5000, 0.4992]]]],
  grad_fn=<SliceBackward>)
diff tensor(0.0071, dtype=torch.float64, grad_fn=<MaxBackward1>)
diff tensor(0.0070, dtype=torch.float64, grad_fn=<MaxBackward1>)

```

```
grad_fn=<SliceBackward>)
coord_x_1 tensor([[-1.0001, -0.9991, -0.9980, -0.9969, -0.9959, -0.9949, -0.9938,
                    -0.9928, -0.9918, -0.9908, -0.9895, -0.9885, -0.9874, -0.9864,
                    -0.9853, -0.9845, -0.9834, -0.9825, -0.9814, -0.9804, -0.9793,
                    -0.9782, -0.9772, -0.9761, -0.9751, -0.9741, -0.9730, -0.9722,
                    -0.9709, -0.9696, -0.9687, -0.9678]]], grad_fn=<SliceBackward>)
coord_y_1 tensor([[-0.9999, -0.9998, -0.9999, -1.0000, -1.0000, -1.0000, -0.9998,
                    -0.9997, -0.9998, -0.9999, -1.0001, -1.0002, -1.0001, -1.0000,
                    -0.9999, -0.9999, -0.9998, -0.9997, -0.9998, -1.0000, -0.9999,
                    -0.9998, -0.9998, -0.9997, -1.0000, -1.0001, -1.0002, -1.0004,
                    -1.0001, -0.9999, -0.9999, -0.9998]]], grad_fn=<SliceBackward>)
coord_x_2 tensor([[-0.9999, -0.9988, -0.9978, -0.9968, -0.9957, -0.9946, -0.9937,
                    -0.9926, -0.9915, -0.9904, -0.9896, -0.9886, -0.9876, -0.9865,
                    -0.9855, -0.9843, -0.9832, -0.9821, -0.9811, -0.9800, -0.9790,
                    -0.9780, -0.9770, -0.9760, -0.9749, -0.9738, -0.9728, -0.9715,
                    -0.9707, -0.9700, -0.9687, -0.9676]]], grad_fn=<SliceBackward>)
coord_y_2 tensor([[-1.0001, -1.0002, -1.0001, -1.0000, -1.0000, -1.0000, -1.0002,
                    -1.0003, -1.0002, -1.0001, -0.9999, -0.9998, -0.9999, -1.0000,
                    -1.0001, -1.0001, -1.0002, -1.0003, -1.0002, -1.0000, -1.0001,
                    -1.0002, -1.0002, -1.0003, -1.0000, -0.9999, -0.9998, -0.9996,
                    -0.9999, -1.0001, -1.0001, -1.0002]]], grad_fn=<SliceBackward>)
```