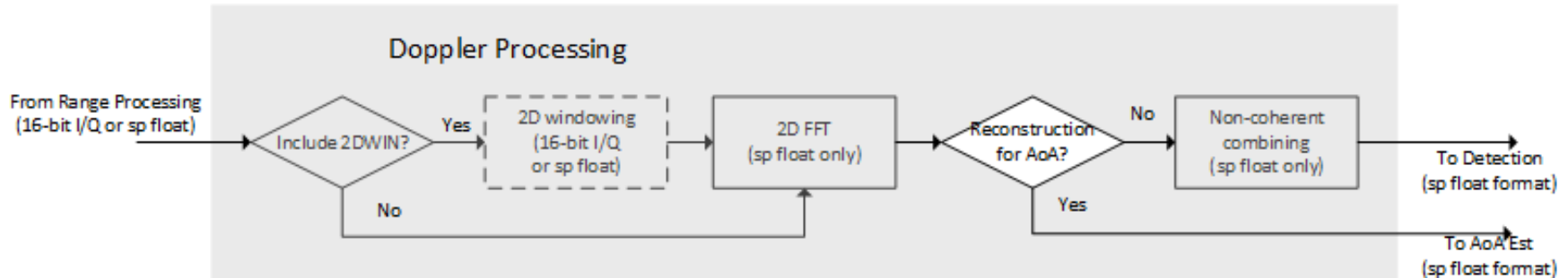


Doppler processing

Doppler Processing Block Diagram



- Input is from range processing, in 16-bit I/Q format, or SP floating-point format, with or without 2D windowing.
 - If 2D windowing is done with range processing, we assume output of range processing is already in format of SP floating-point.
 - If 2D windowing is done with Doppler processing, we assume output of range processing is in format of 16-bit I/Q
 - Above assumptions are natural for saving cycles, and need to be guaranteed by integrator of these modules
- Currently 2D FFT is floating-point DSPF_sp_fftSPxSP only!!
- Currently we only support non-coherent combining for integration. Output of integration is total power from all antennas in SP floating-point only!
- If input flag indicate the input data is for reconstruction of antenna samples for AoA estimation (memory limited scenario), integration will not be executed, and antenna samples of 2D FFT output of corresponding range bin will be sent out.
- Memory used
 - $\text{numChirpsPerFrame}/2 * \text{sizeof(float)}$ bytes for 2D window function if 2D windowing is included
 - $2 * \text{fft1DSize} * \text{sizeof(float)}$ bytes for DSPF_sp_fftSPxS twiddle factors

Doppler Processing Benchmarks

C66x Benchmarks

| FFT size | FFT type | 2D Win included | Input Format | cycles |
|----------|----------|-----------------|--------------|--------|
| 32 | float | yes | 16x16 | 2107 |
| 64 | float | no | float | 2792 |
| 128 | float | yes | 16x16 | 5713 |
| 256 | float | yes | 16x16 | 10807 |

C674x Benchmarks

| FFT size | FFT type | 2D Win included | Input Format | cycles |
|----------|----------|-----------------|--------------|--------|
| 32 | float | yes | 16x16 | 2746 |
| 64 | float | no | float | 3707 |
| 128 | float | yes | 16x16 | 7599 |
| 256 | float | yes | 16x16 | 14783 |