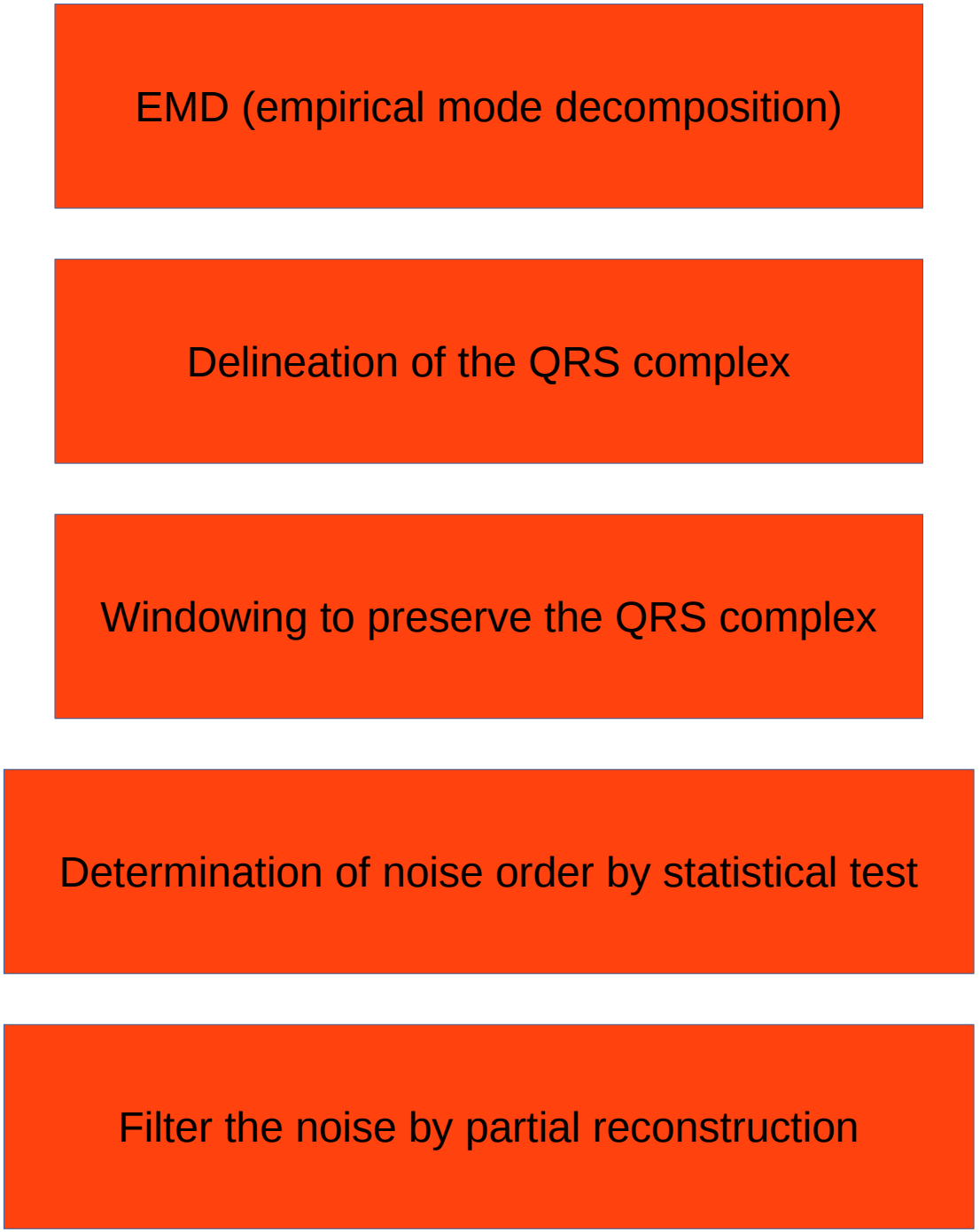
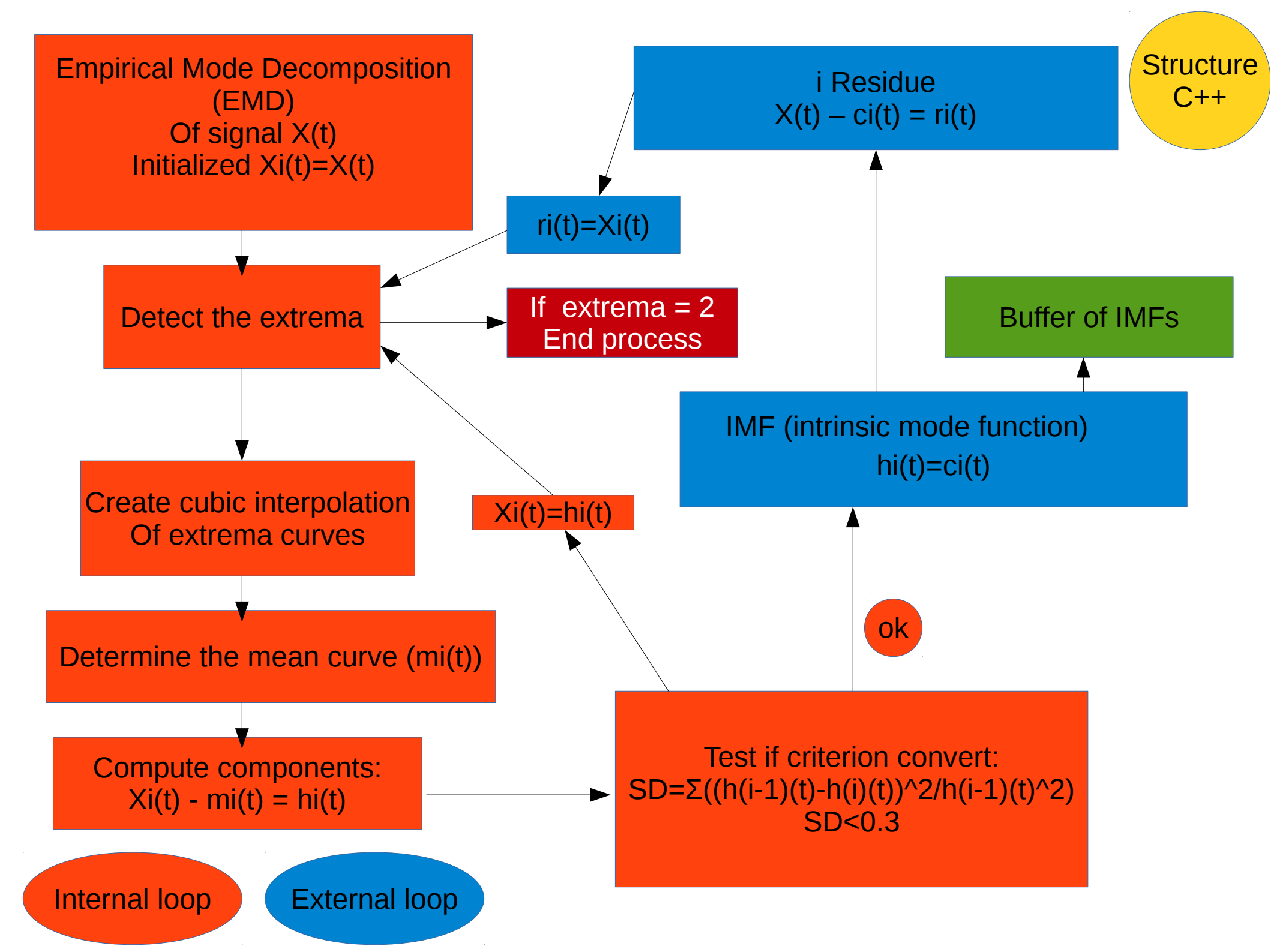
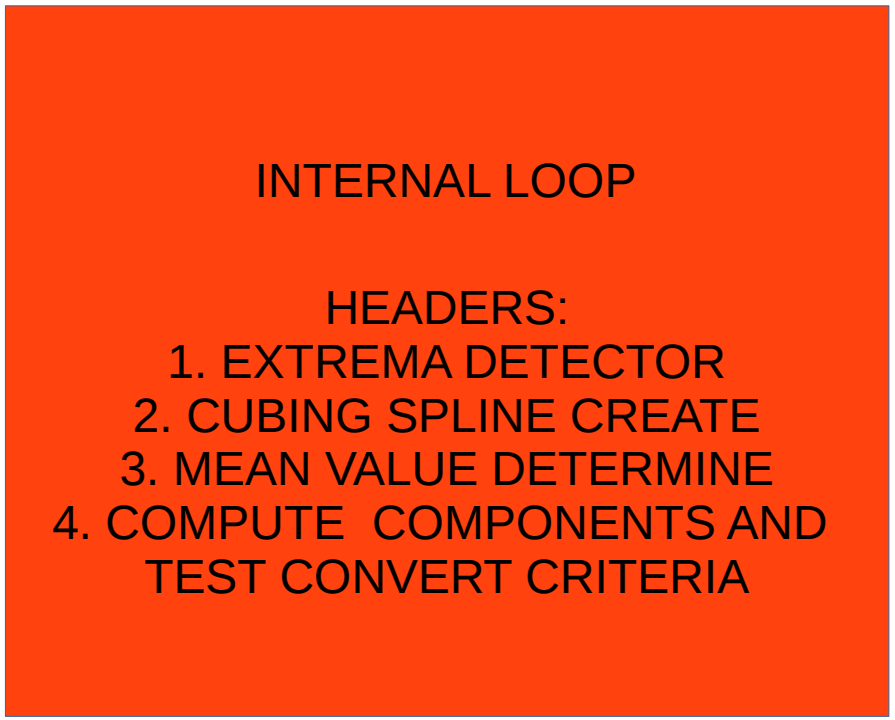
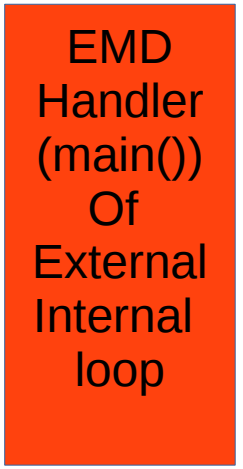
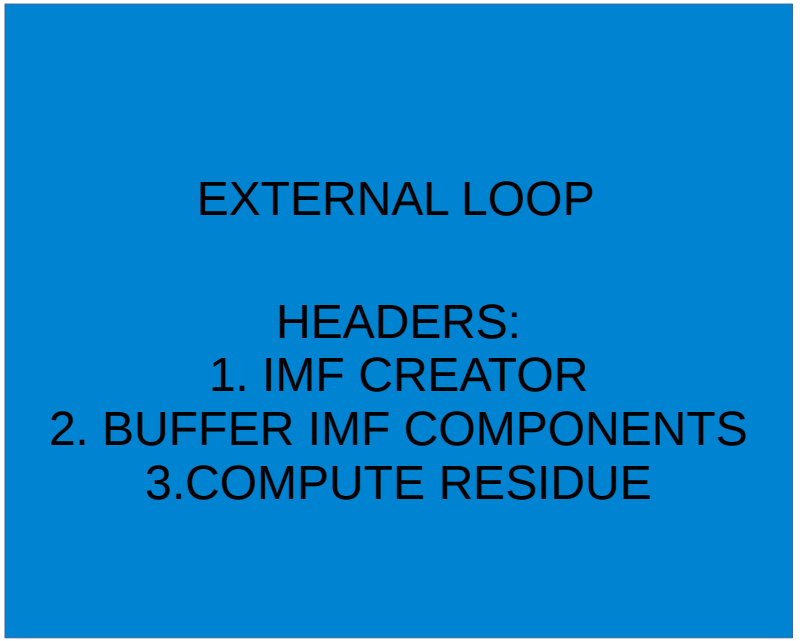
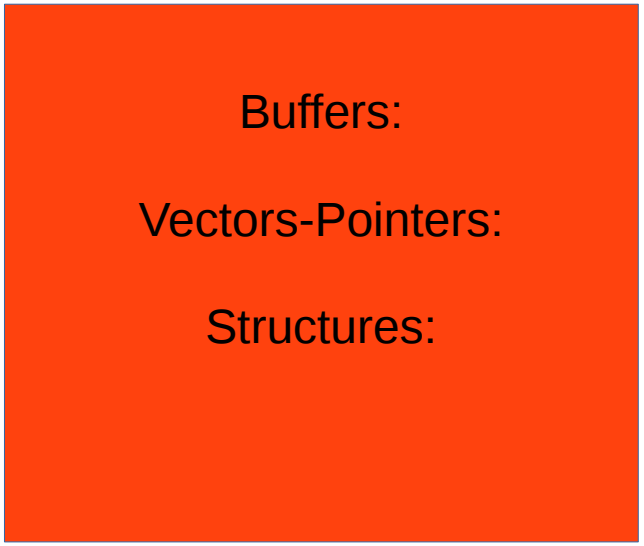

EMD (empirical mode decomposition)
Delineation of the QRS complex
Windowing to preserve the QRS complex
Determination of noise order by statistical test
Filter the noise by partial reconstruction

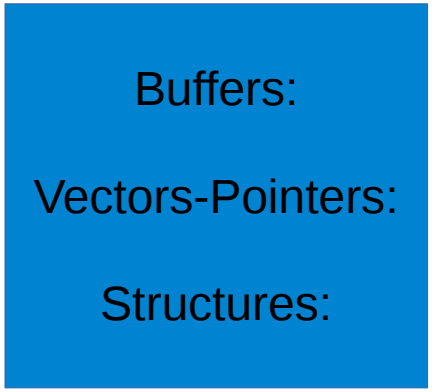

Empirical Mode Decomposition
(EMD)
Of signal X(t)
Initialized Xi(t)=X(t)
i Residue
X(t) – ci(t) = ri(t)
Structure
C++
ri(t)=Xi(t)
Detect the extrema
If extrema = 2
End process
Buffer of IMFs
IMF (intrinsic mode function)
hi(t)=ci(t)
Create cubic interpolation
Of extrema curves
Xi(t)=hi(t)
ok
Determine the mean curve (mi(t))
Compute components:
Xi(t) - mi(t) = hi(t)
Test if criterion convert:
SD=Σ((h(i-1)(t)-h(i)(t))^2/h(i-1)(t)^2)
SD<0.3
Internal loop
External loop

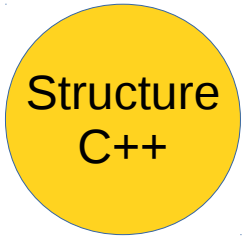

INTERNAL LOOP
HEADERS:
1. EXTREMA DETECTOR
2. CUBING SPLINE CREATE
3. MEAN VALUE DETERMINE
4. COMPUTE COMPONENTS AND TEST CONVERT CRITERIA

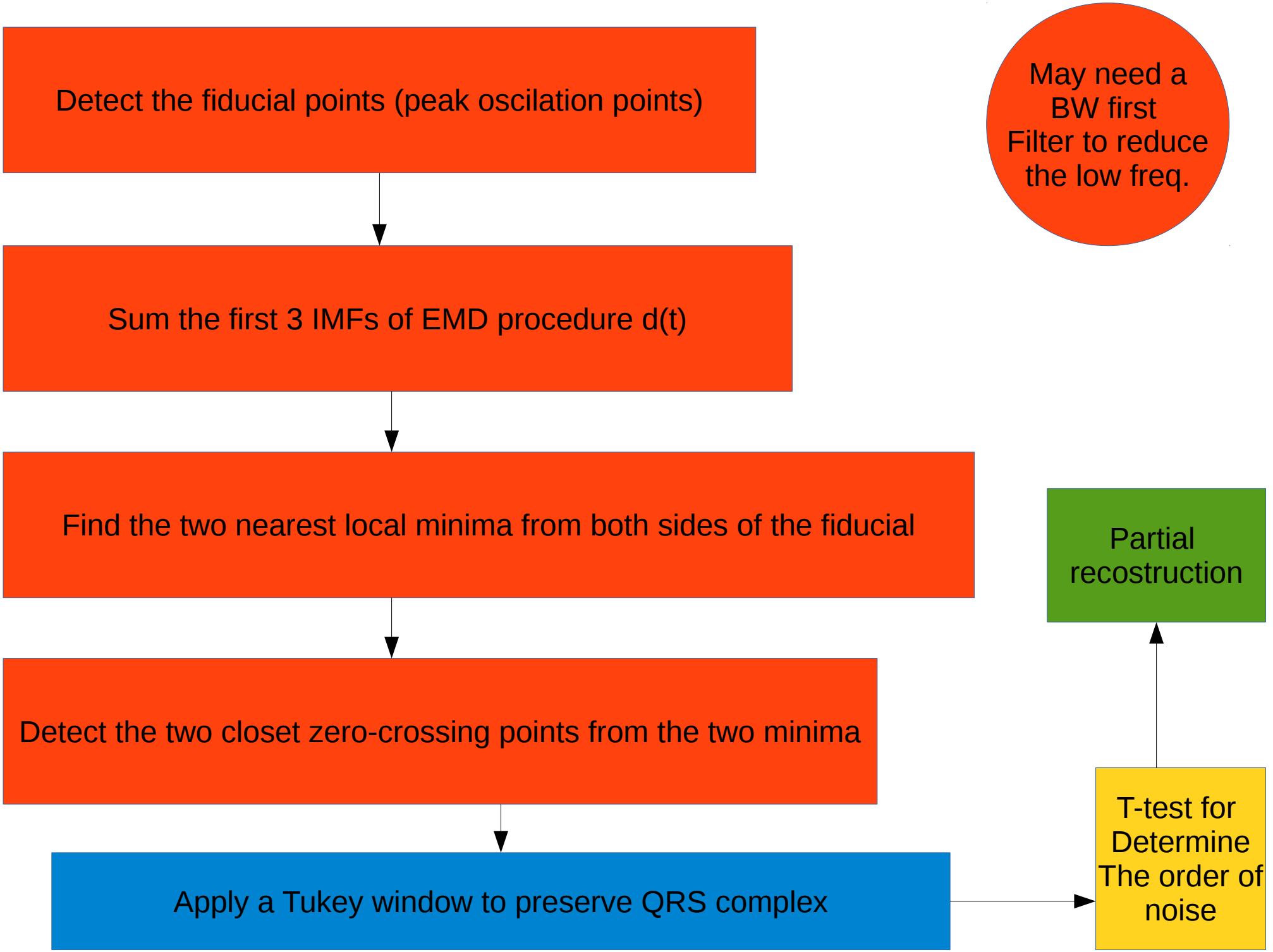

EMD Handler (main()) Of External Internal loop


EXTERNAL LOOP
HEADERS:
1. IMF CREATOR
2. BUFFER IMF COMPONENTS
3.COMPUTE RESIDUE


Buffers:
Vectors-Pointers:
Structures:


Buffers:
Vectors-Pointers:
Structures:


Structure
C++


Detect the fiducial points (peak oscilation points)
May need a BW first Filter to reduce the low freq.
Sum the first 3 IMFs of EMD procedure d(t)
Find the two nearest local minima from both sides of the fiducial
Partial recostruction
Detect the two closet zero-crossing points from the two minima
T-test for Determine The order of noise
Apply a Tukey window to preserve QRS complex