Notes on Matlab audio software: 3 Oct 2013:

1. Onset and AM spikes.

Overall aim:

The idea here was to use a similar approach to that used for the original onset spikes to create AM spikes: that is, a neuron which would output a spike for each AM peak, in each band. Conceptually, the approach taken was to use the same technique as in the LIF neuron in the onset, but with different parameters, so that the onsets being detected were much closer together. The parameters to be used are set up in setparameters\_monoonsets: for the onset spikes, they are in the structure onset, and for the AM spikes, in the structure am. In addition, because the AM detecting neurons will also detect onsets (since even using different parameter sets they will always detect an isolated onset), there is a facility to quieten (inhibit) and AM detecting cell when an onset cell has spiked. This uses inhibition from Onset cells to AM cells.

**Test31July2013** calls

setparameters\_monoonsets(): setparameters\_monoonsets sets up all the parameters for the run in a file

generateonsetandamspikes\_mono(): generateonsetandamspikes\_mono creates the onset and AM spikes: it expects the AN spikes to have already been generated.

**generateonsetandamspikes\_mono** calls

genonsetspikes2\_mono: genonsetspikes2\_mono returns the an and onset-wide structures

am\_side\_mono: am\_side\_mono returns the amfiretimes datastructure

spikeraster : draws a set of rasters of spikes

overallonset : returns the intervals and channels used in the onsets

**genonsetspikes2\_mono** calls

onsetside\_zc8\_mono: returns the AN firing times and the onset firing times

**onsetside\_zc8\_mono** calls

iandfneurons: runs the leaky integrate and fire (LIF) neurons

depsynsimple1:implements a Meddis hair cell (depressing synapse)

**am\_side\_mono** calls

iandfneurons\_withinhibition: implements an LIF neuron with inhibition: the inhibition is intended to come from onset neurons that have recently fired.

depsynsimple1: as above.