Comments on the bat signals

The Matlab data files “bat_PIII.mat” and “bat_PV.mat” correspond to 2 sequences of bat sonar signals recorded in the field (Villars-les-Dombes, France, 06/05/82) during hunting phases of *Myotis mystacinus*. The digitization has been done with a sampling frequency of 7.2 kHz and a bandpass filter [250 Hz, 2.5 kHz], the tape speed being reduced by a factor of 32. This means that this corresponds to an actual sampling frequency of 230.4 kHz and an effective bandwidth [8 kHz, 80 kHz]. For each sequence, the total number of data points is 216 000.

The files “bat_PIIId.mat” and “bat_PVd.mat” correspond to details of the above sequences, selecting signals of particular interest. The file « veille.mat » is a detail of “bat_PIII.mat”, namely the first long signal (followed by some heavy reverberation) which begins a new hunting sequence after the ending of the previous one.

The files “bat_3.mat” and “bat_3d.mat” correspond to other recordings in which long and short signals (likely from 2 different bats) co-exist and even overlap.

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Some references

P.E. NACHTIGALL, P.W.B. MOORE, (*eds.*), 1988 :
Animal Sonar - Processes and Performance, Plenum Press, New York.

P. FLANDRIN, P. CROS, G. MANGE, 1986 :
“Sensitivity of Doppler-Tolerance to the Structure of Bat Like Sonar Signals”.
Acustica, Vol. **62**, pp. 40-47.

Y. TUPINIER, N. GACHE, P. FLANDRIN, 1995 :
“Analyses Fines des Cris Sonar des Chauves-souris : Evolution et Perspectives”,
Le Rhinolophe, Vol. **11**, pp. 83-90.

P. FLANDRIN, September 1986 :
“Time-Frequency Processing of Bat Sonar Signals”.
NATO ASI on Animal Sonar, Helsingor (DK), in : Animal Sonar - Processes and Performance (P.E. Nachtigall, P.W.B. Moore, *eds.*), pp. 797-802, Plenum Press, New York, 1988.

See also

F. HLAWATSCH, G.F. BOUDREAUX-BARTELS, 1992 :
« Linear and Quadratic Time-Frequency Signal Representations ».
IEEE Signal Proc. Mag., Vol. 9, No. 2, pp. 21-67.

A. FISCHETTI, Novembre 1989 :
« Ils espionnent le sonar des chauves-souris ».
Sciences et Avenir, pp. 50-55.