

STETAU Project - e-Auscultation



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April, 2008



Agenda

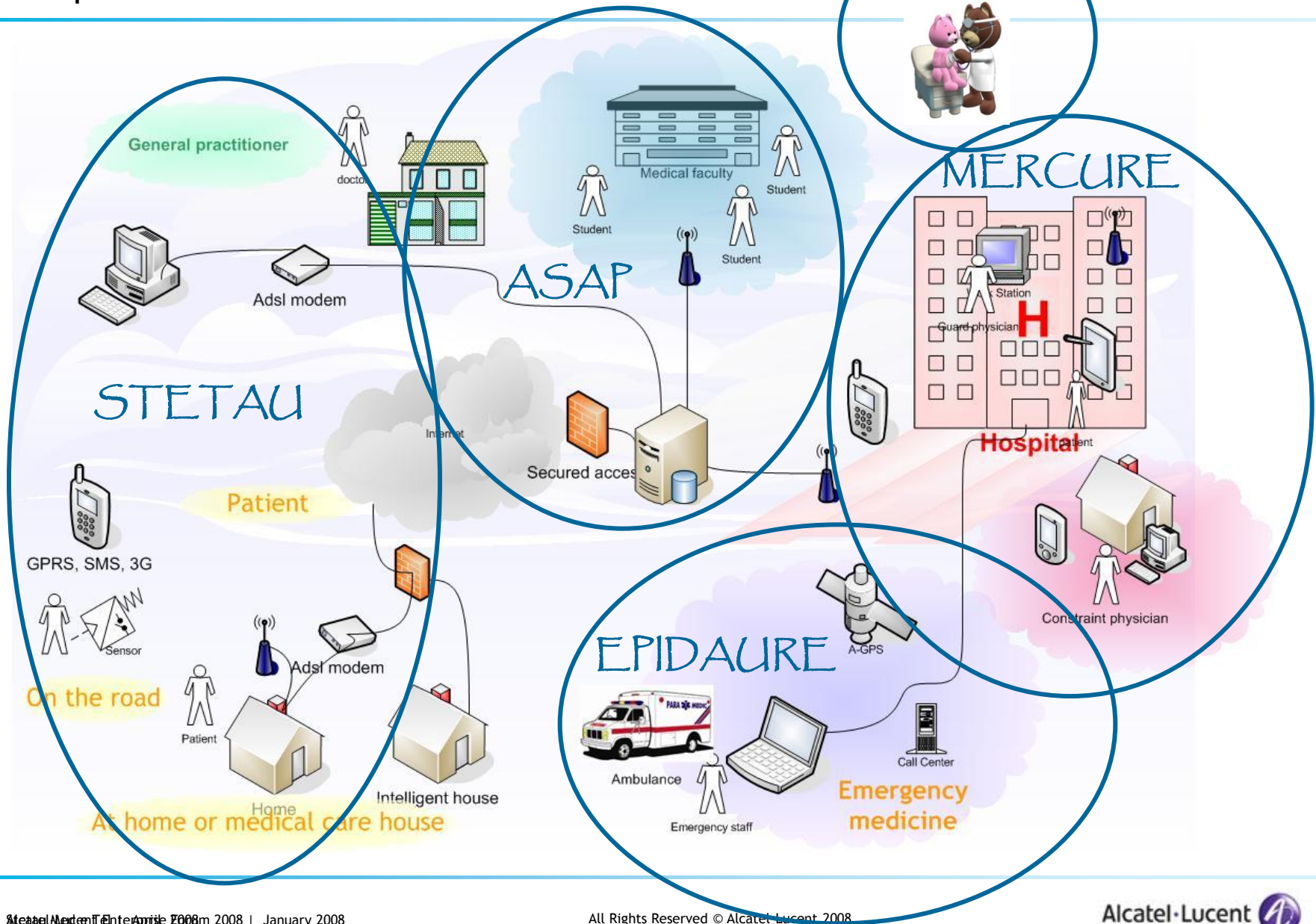
1. Therapeutic Innovations Cluster - The MERCURE platform
2. The STETAU project
3. Alcatel-Lucent architecture for eAuscultation
4. Heart and Lung auscultation - healthy subjects
5. Insight in pathology
6. Conclusion

1

The MERCURE platform

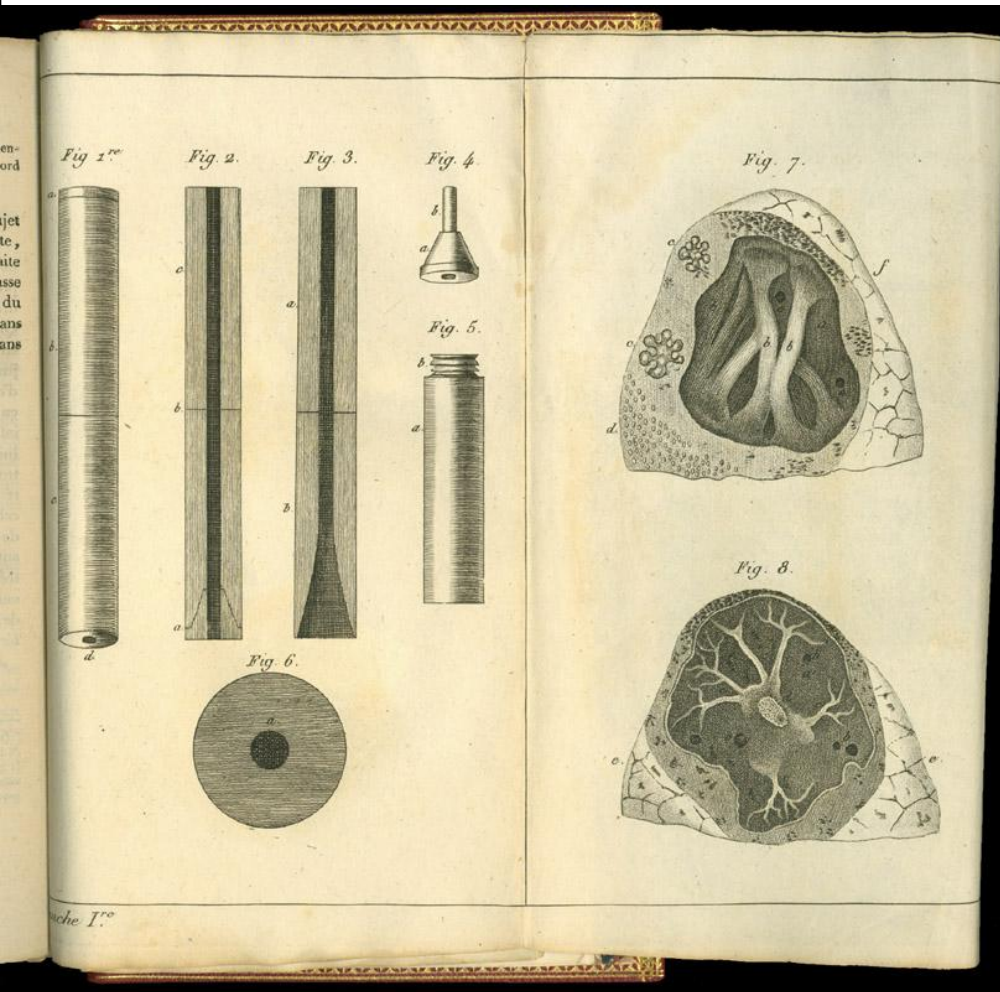
The MERCURE platform

Therapeutic Innovations Cluster



2 The STETAU Project

The STETAU Project - The challenge



Since Laennec (1816), auscultation is still

- subjective and difficult to share,
- hard to analyze because of head and ambient noise
- lacking of convenient teaching tools



STETAU

« Système et Technologies d'Enregistrement et de Traitement des
Sons Auscultatoires »

Electronic Stethoscope:

- Auscultation of cardiovascular and pulmonic sounds
- Recordings of the sounds
- Detection of abnormalities (wheezes and crackles, murmurs ...)
- Enhanced graphical man-machine interface

Based on:

- Bluetooth Cordless technology (Patient Area Network)
- Signal Processing Algorithms (Head noise suppression, ambient noise cancellation)
- Signal Analysis (Diagnosis Support)

Applications : Telemedecine, local or remote monitoring for patients, second opinion, teaching ...

- **Pneumology**

- Bronchiolitis, asthma, COPD, pneumopathy ...

- **Cardiovascular**

- Valvulopathy, diagnostic of heart murmurs , search of additional sounds, ...
 - peripheral arterial disease of the lower limbs, carotid stenosis...

- **Public health**

- Prevention : school, professional...

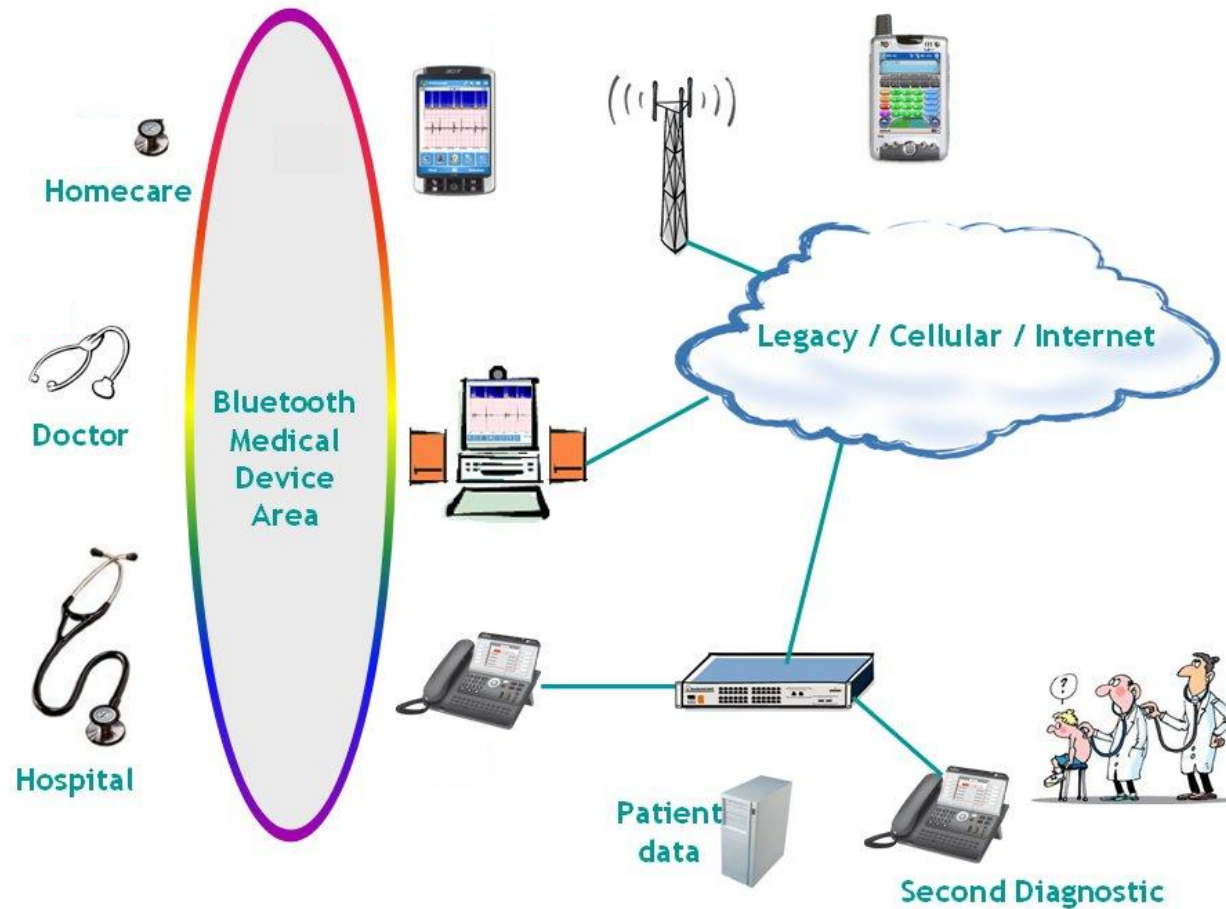
- **Gynaecology obstetrics**

- Prenatal auscultation of the foetus health, remote consultation of a specialist...

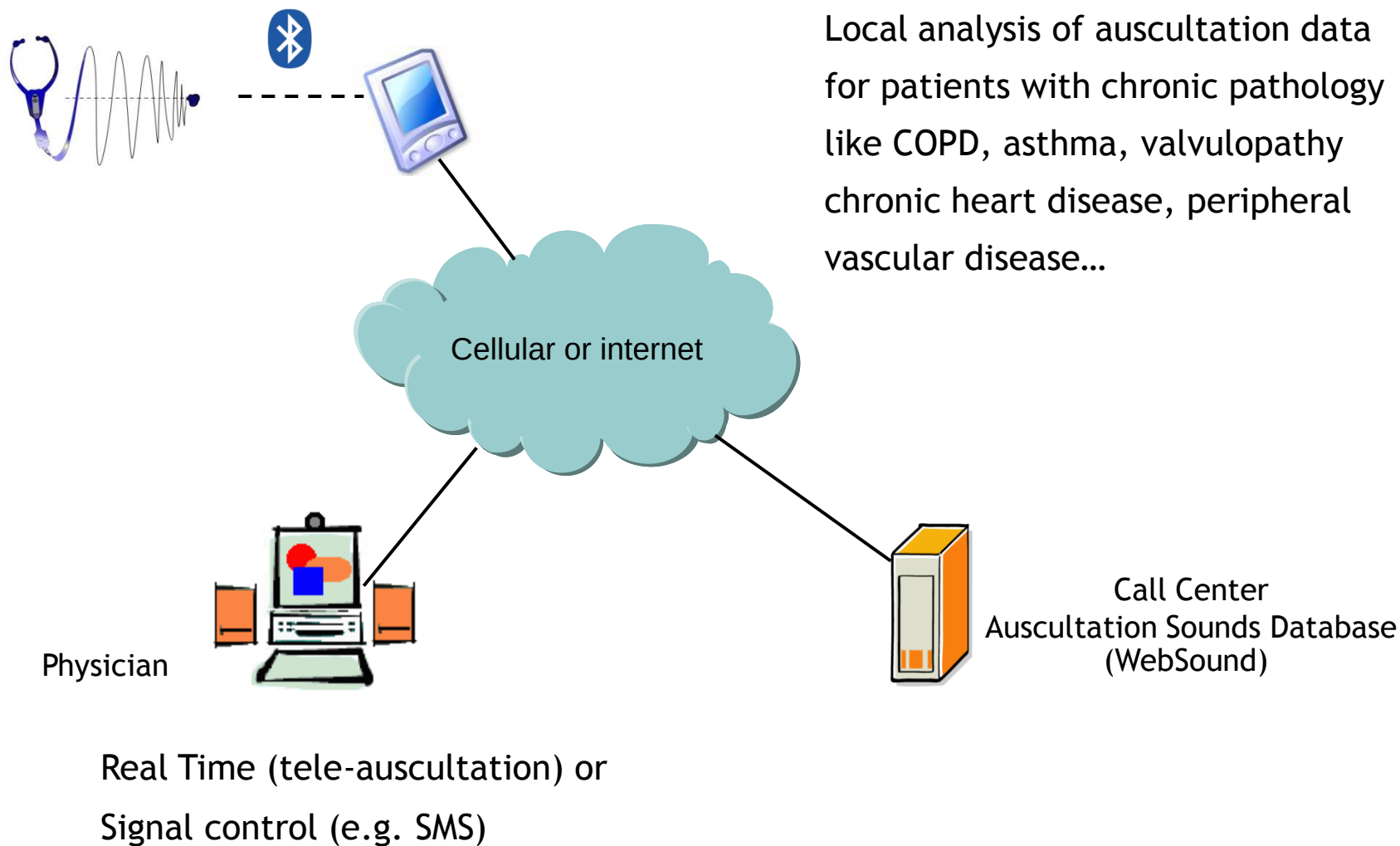
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Alcatel-Lucent Architecture for eAuscultation

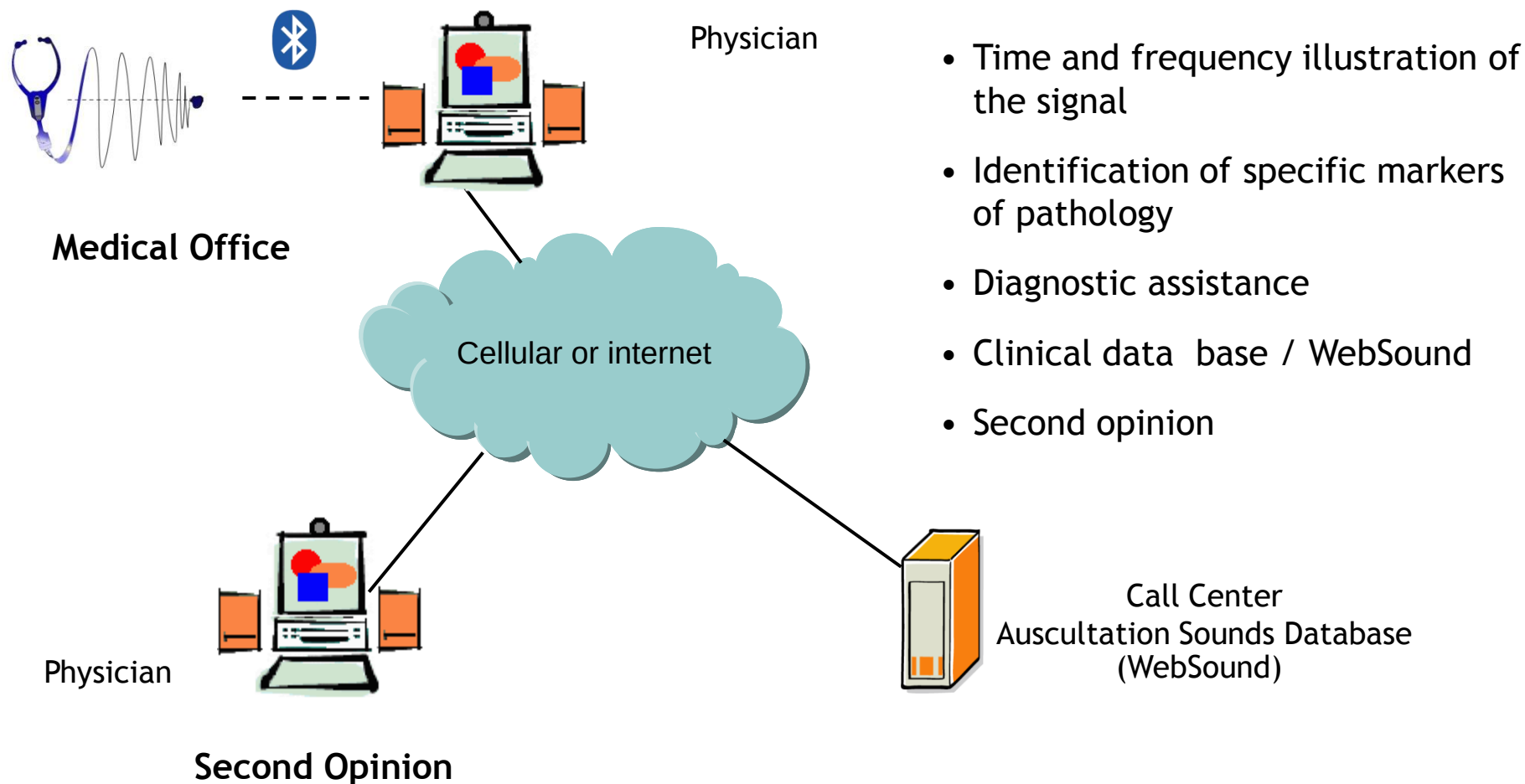
The STETAU Project - architecture



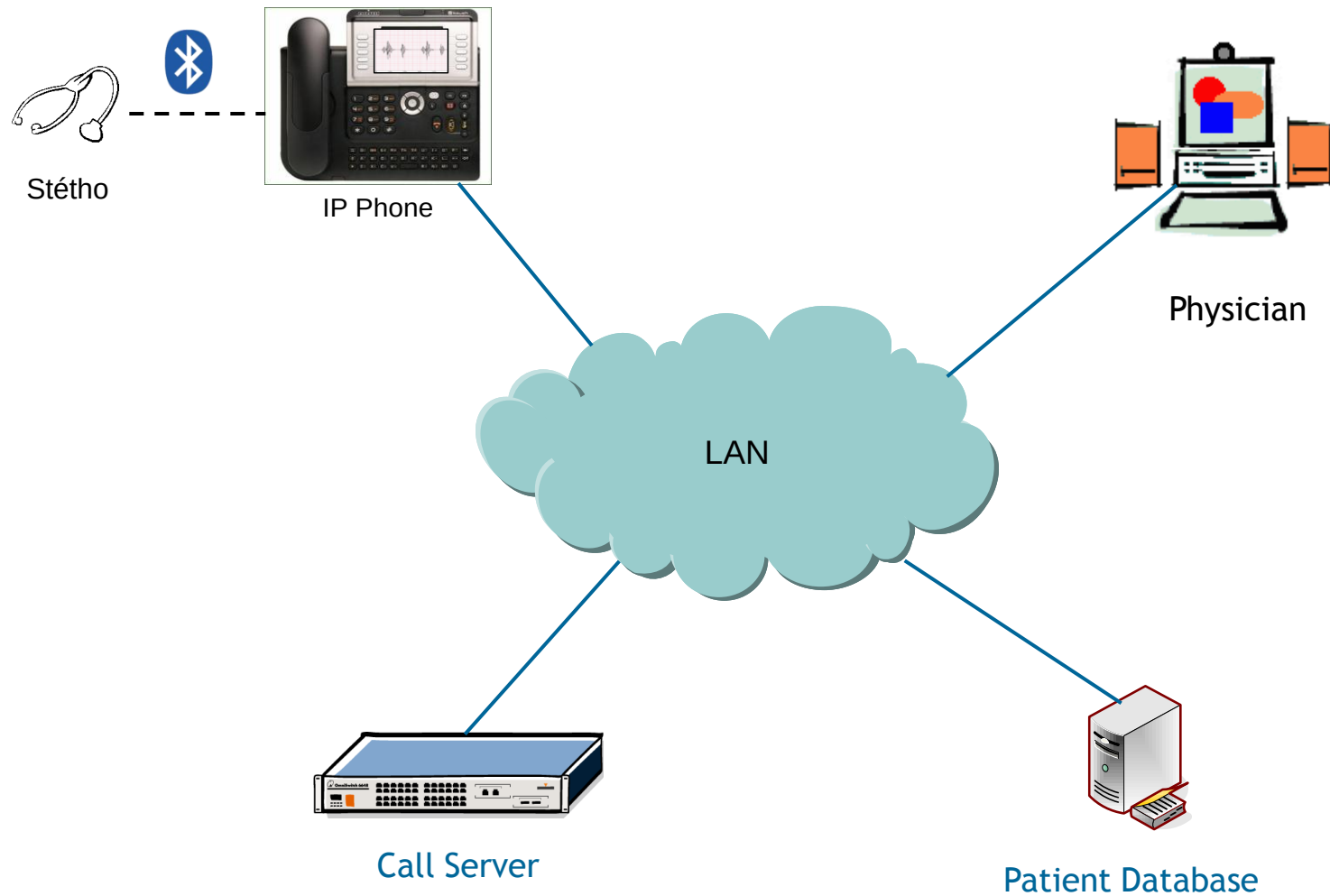
Use case : patient at home



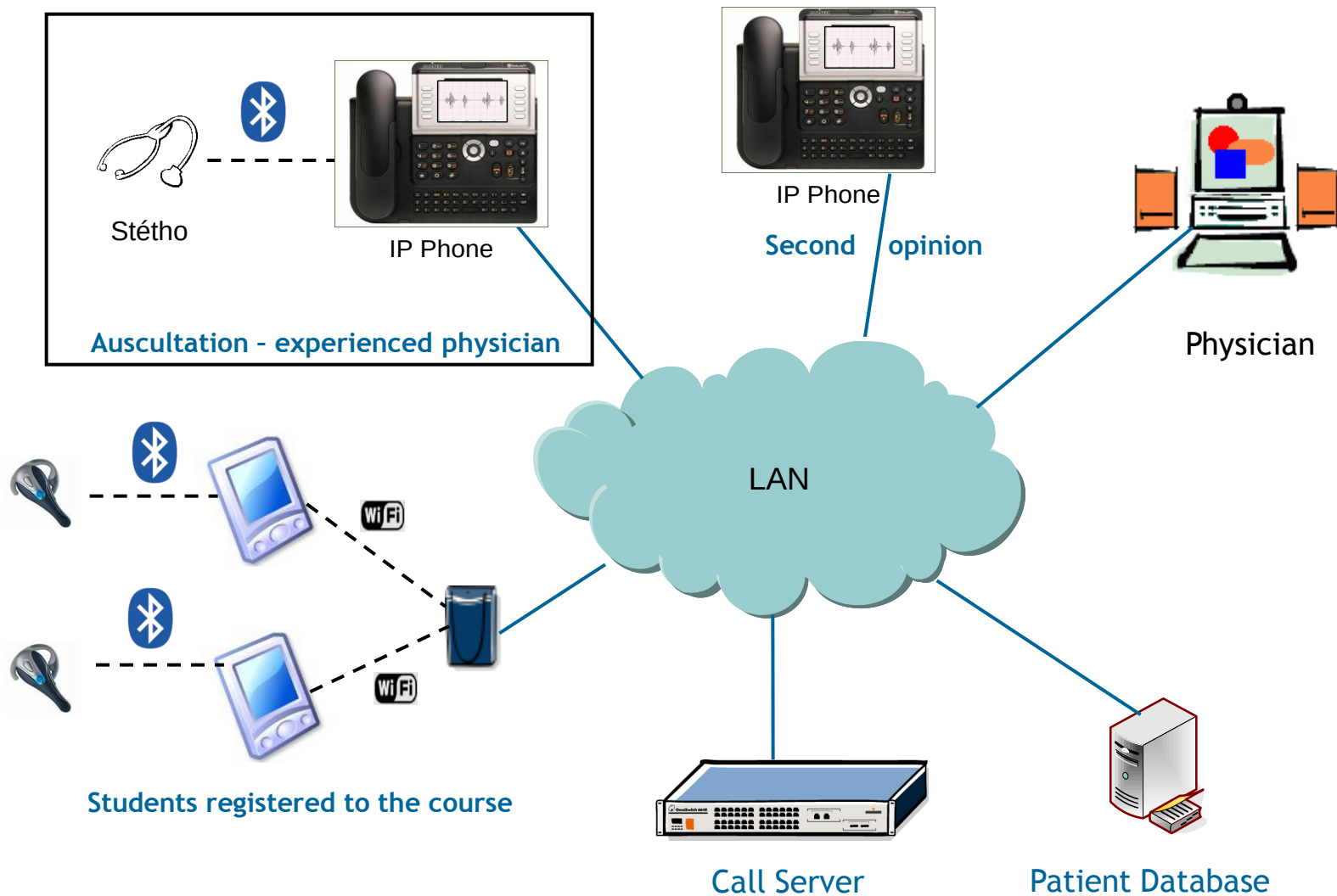
Use case : physician



Use case : hospital - auscultation, patient database



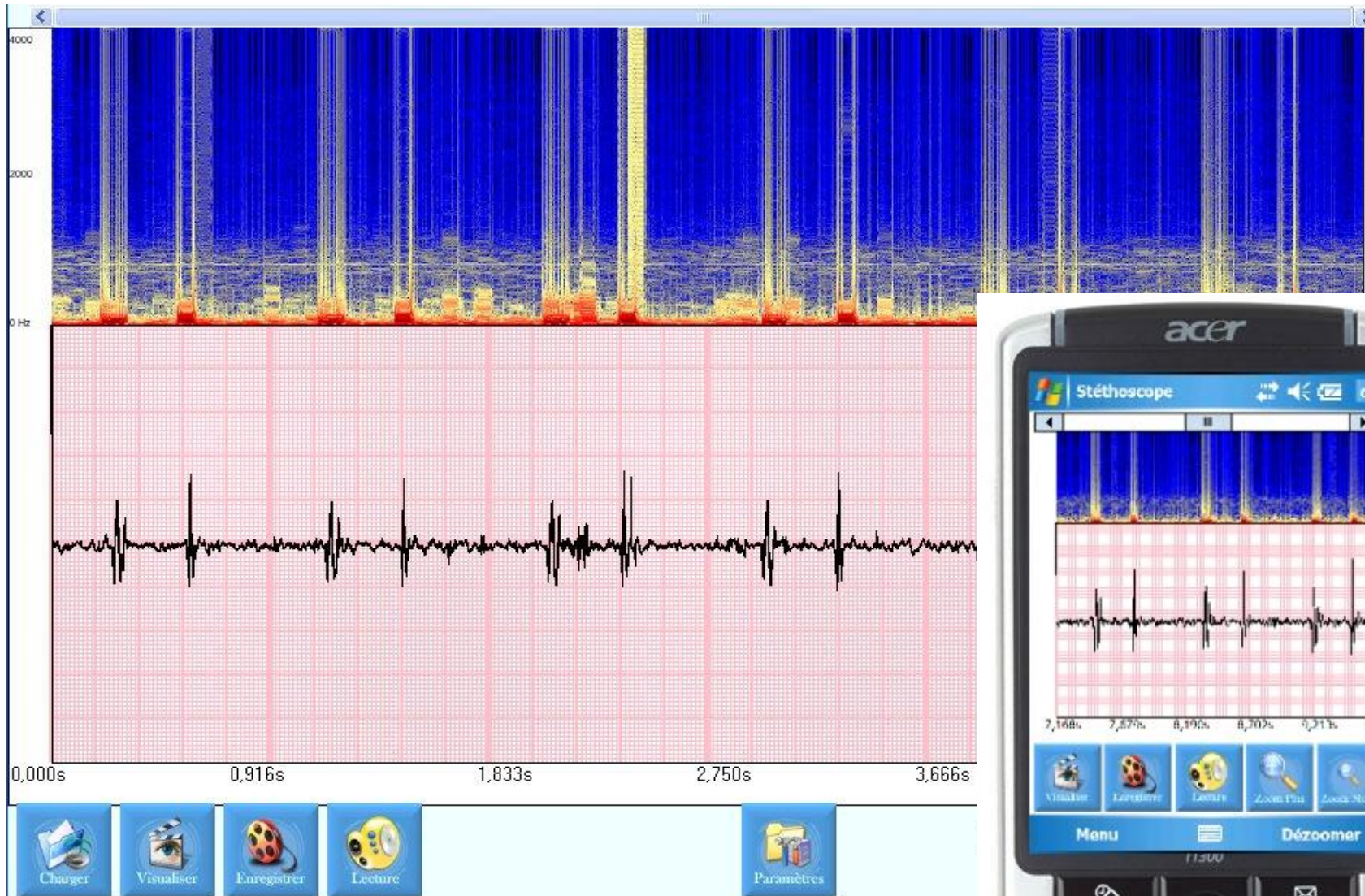
Use case : hospital - second opinion and teaching



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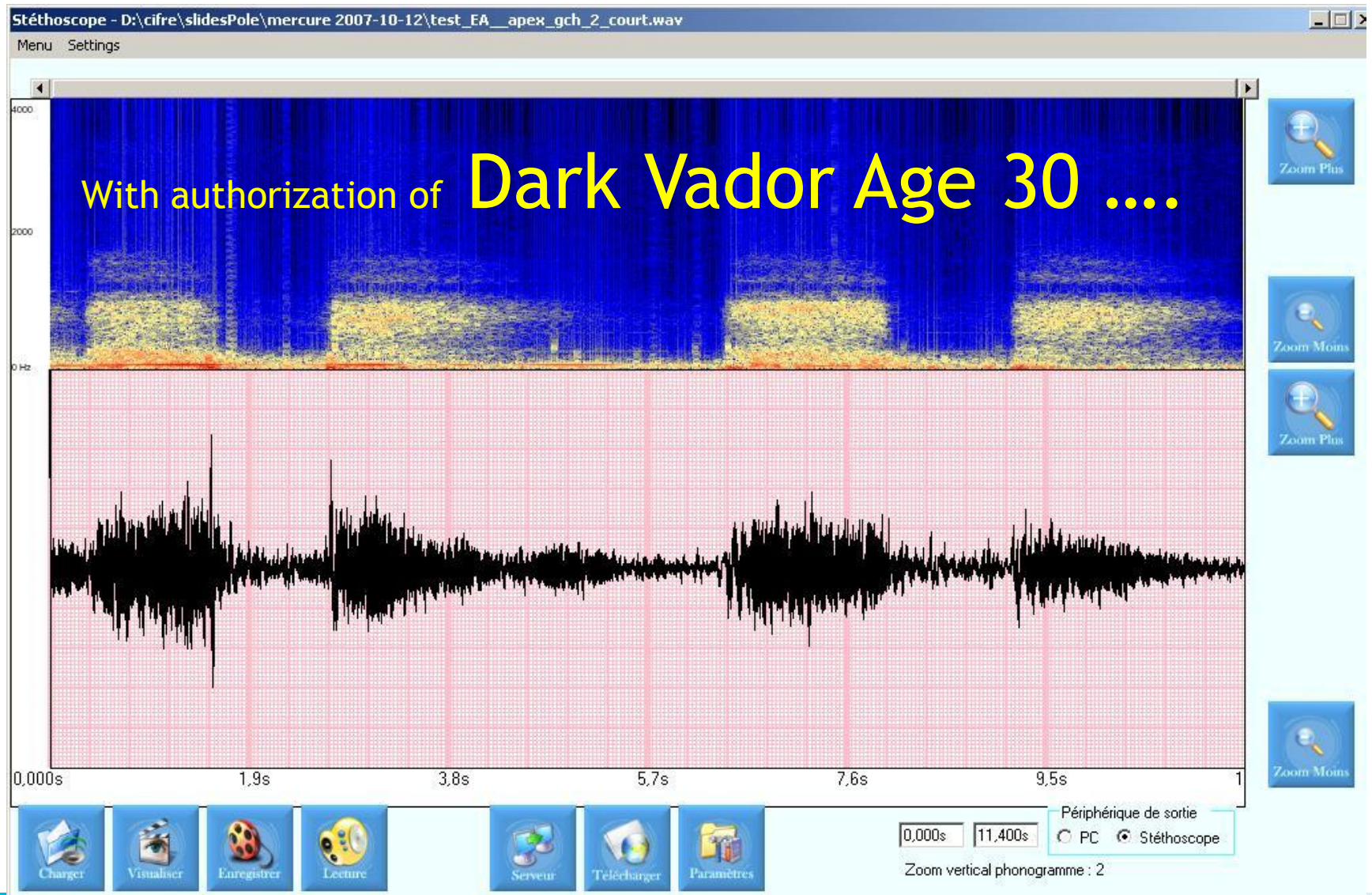
Heart and Lung auscultation Healthy subjects

Normal heart auscultation





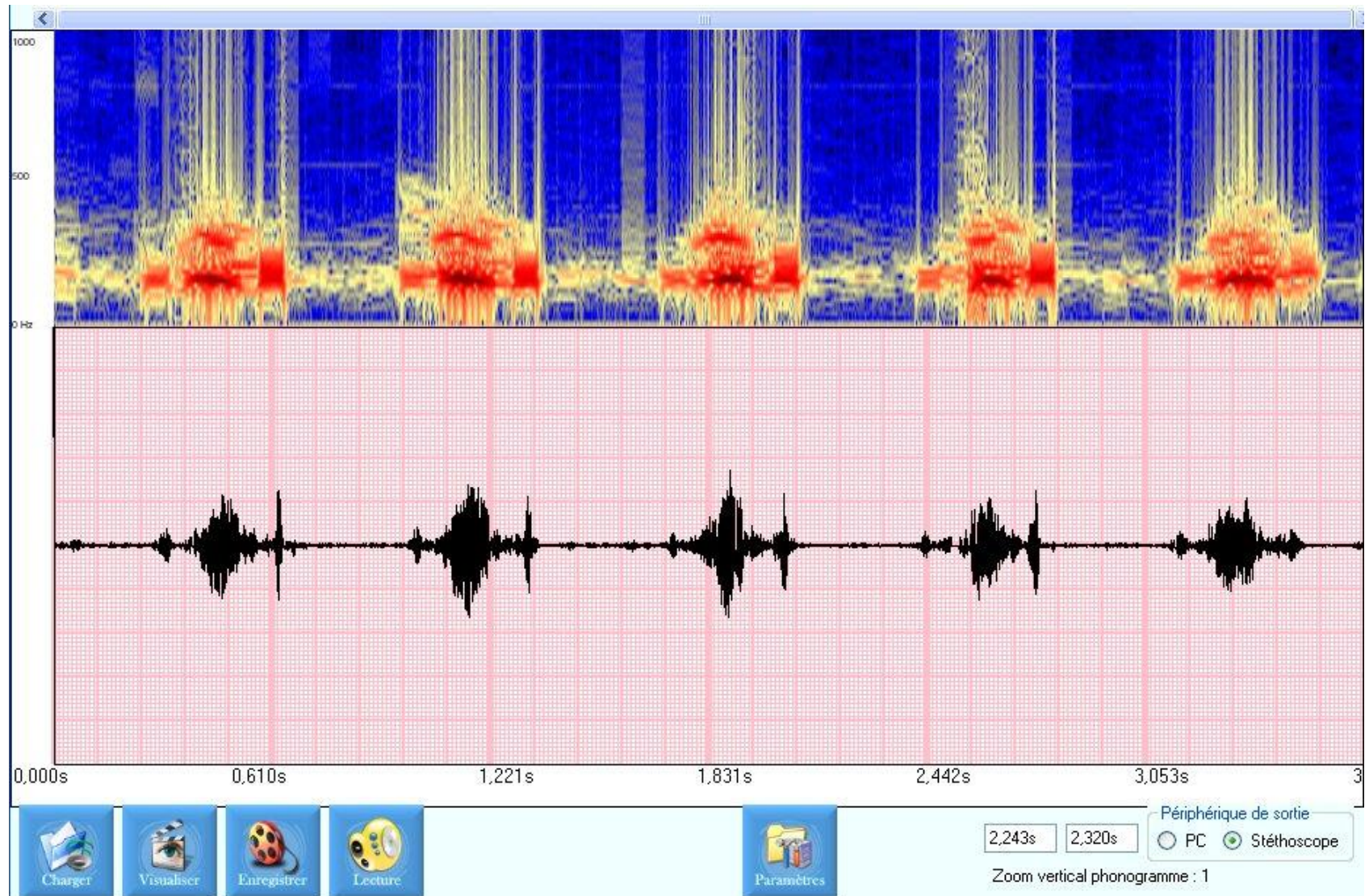
Normal pulmonary auscultation



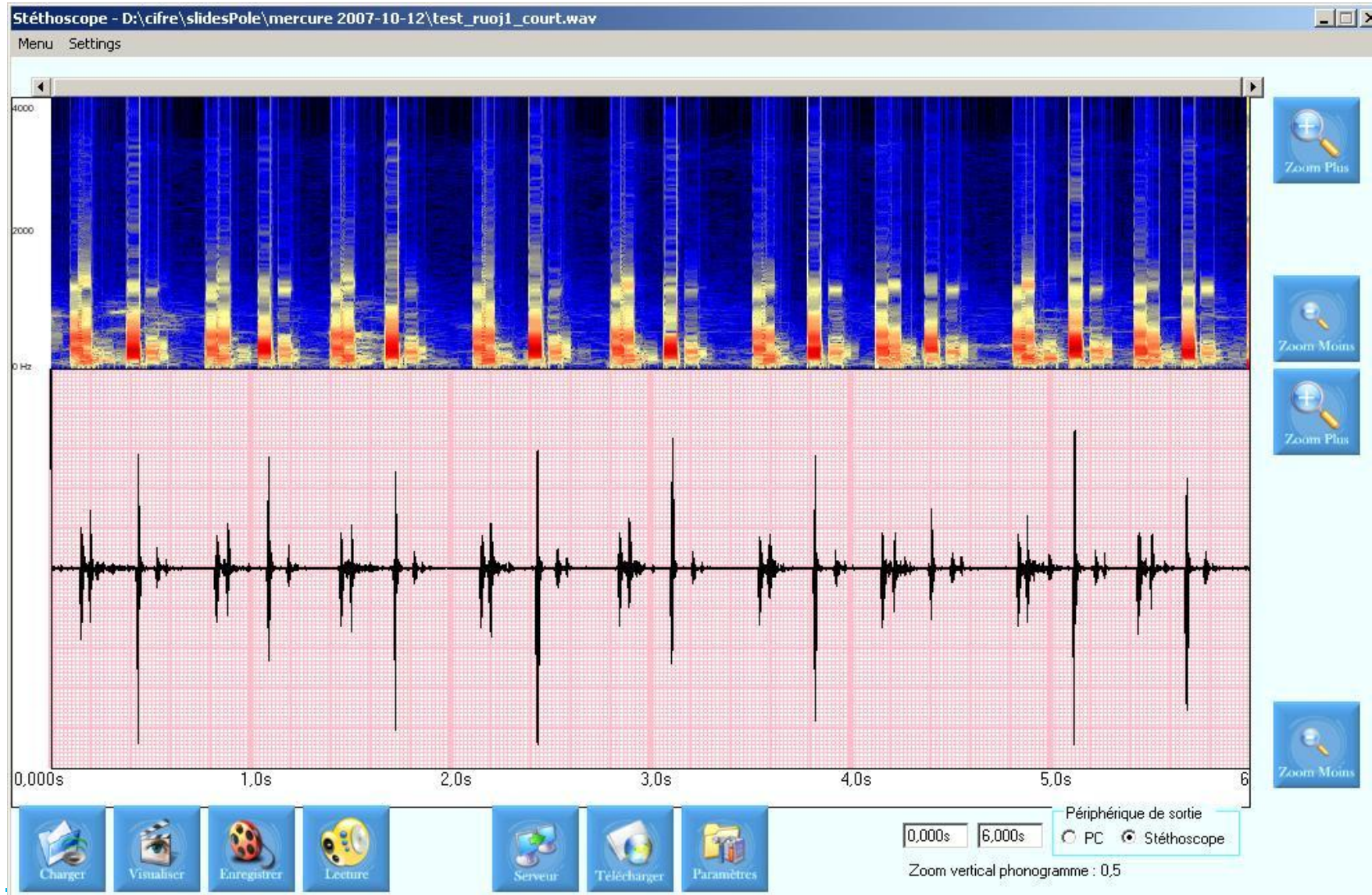
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Insight in pathology

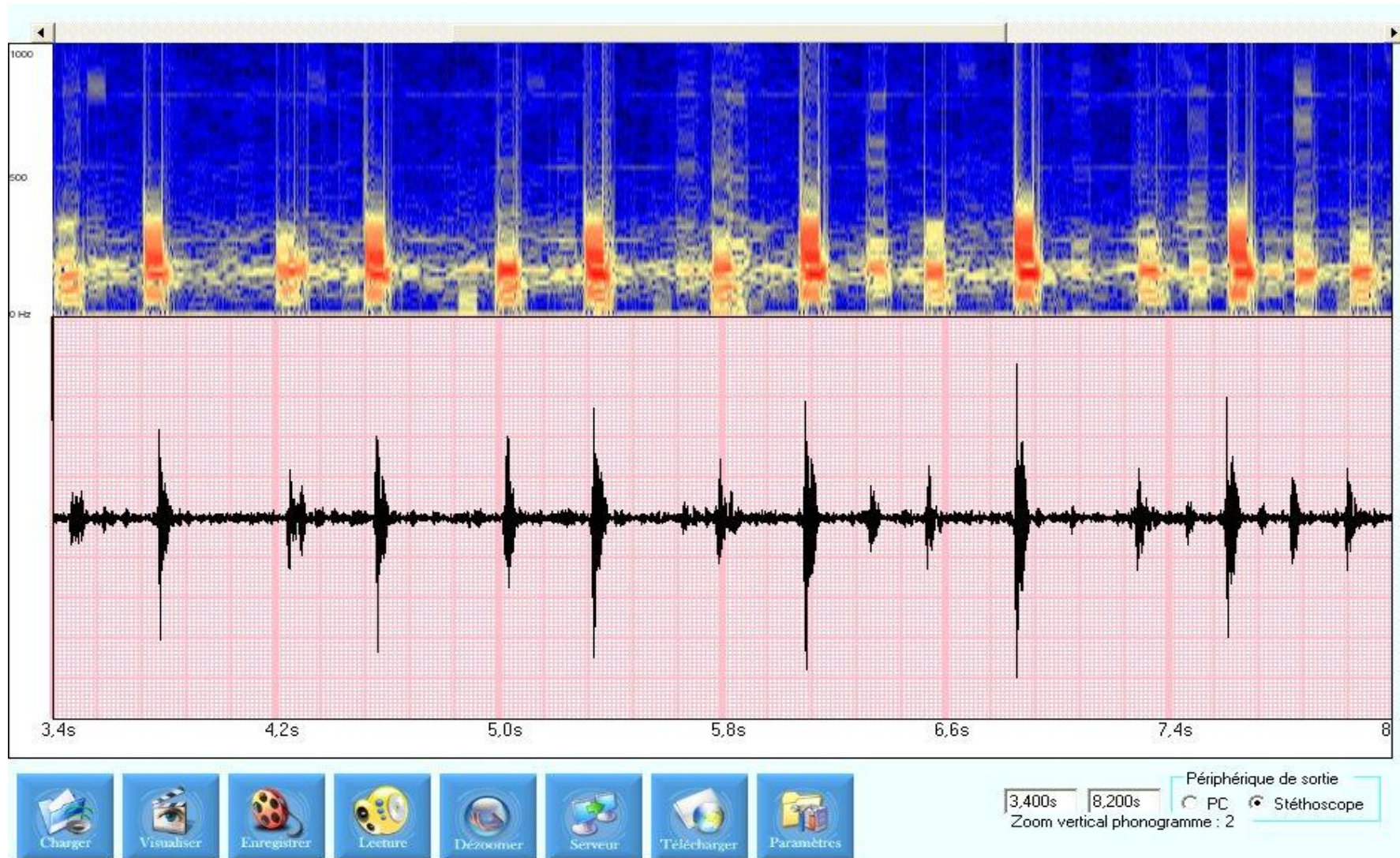
Heart auscultation - severe aortic stenosis - systolic ejectional murmur



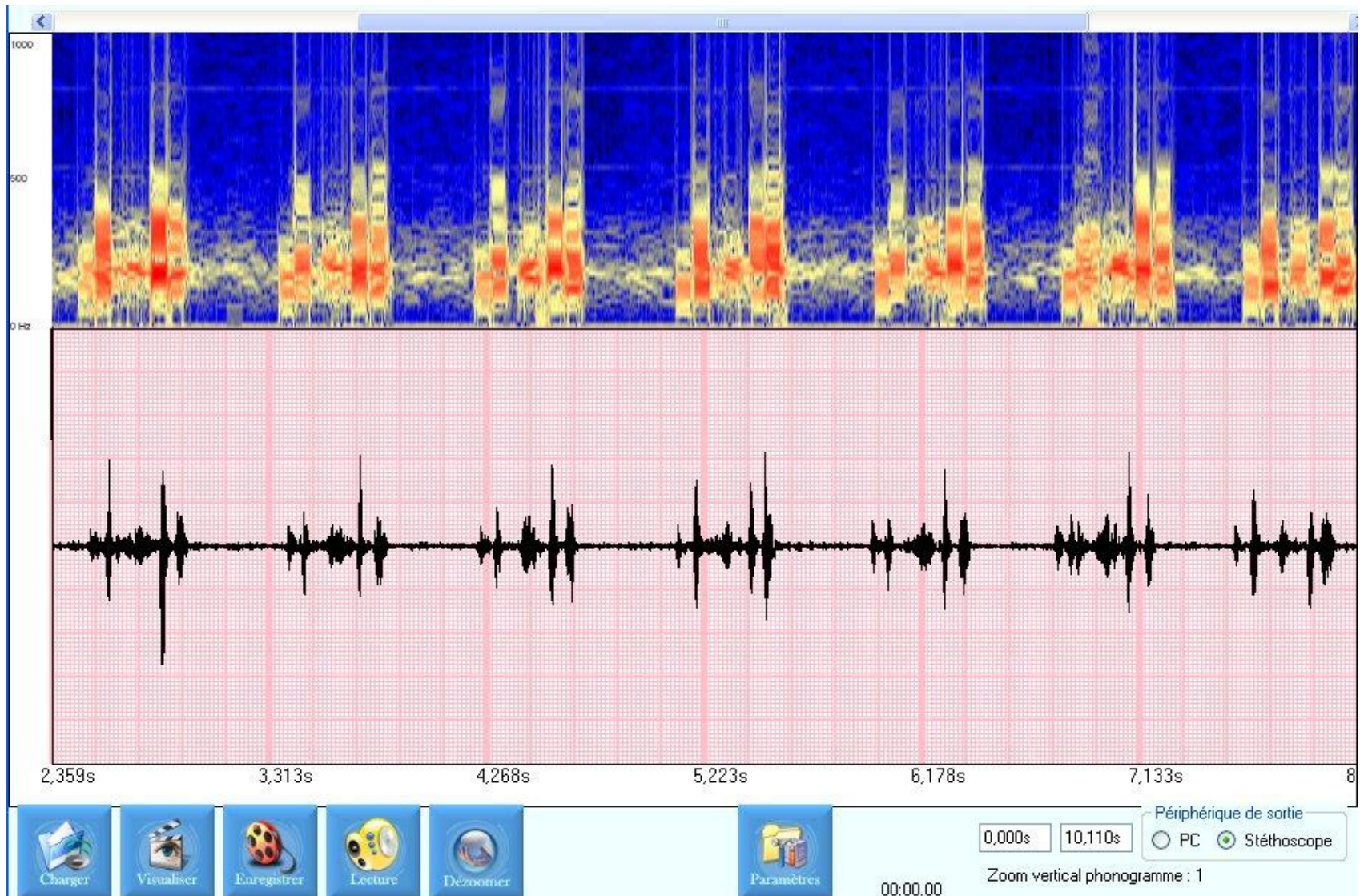
Heart auscultation-prosthetic valves (mitral and aortic Starr - atrial fibrillation)



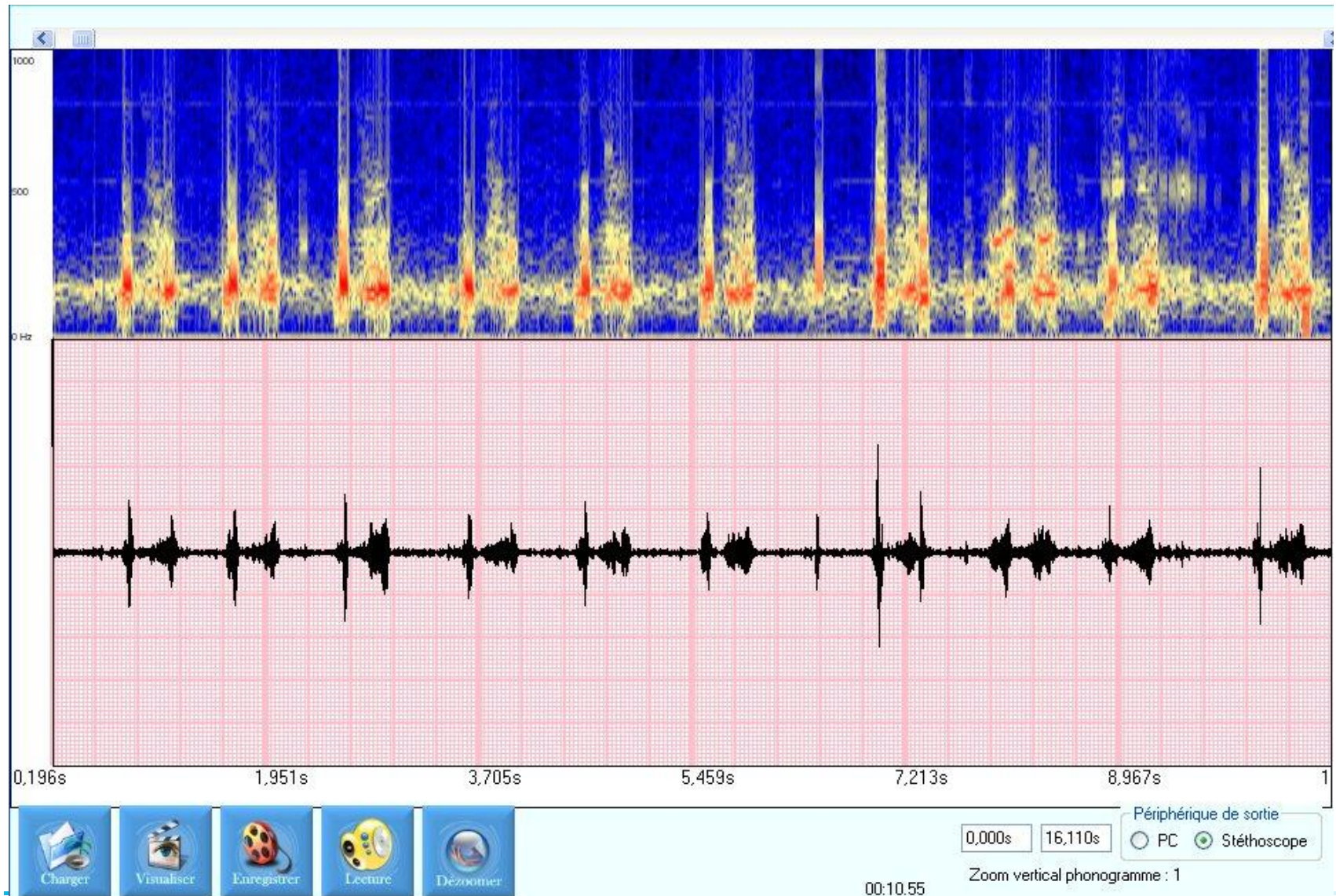
Intermittent high frequency systolic murmur - Triolet



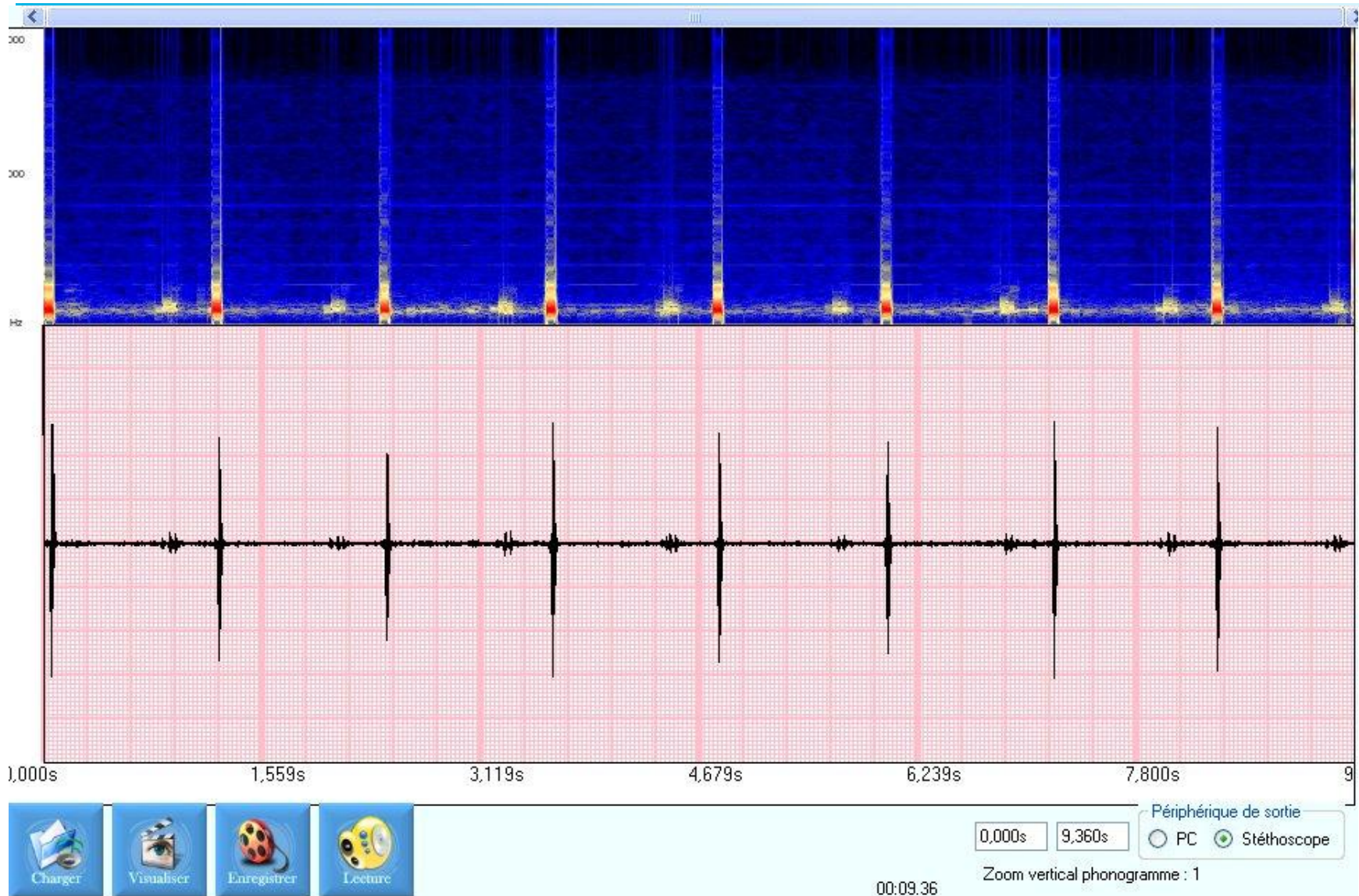
Mild pulmonary artery stenosis plus very large RBB



Mid systolic murmur, mitral valve prolapse, atrial fibrillation

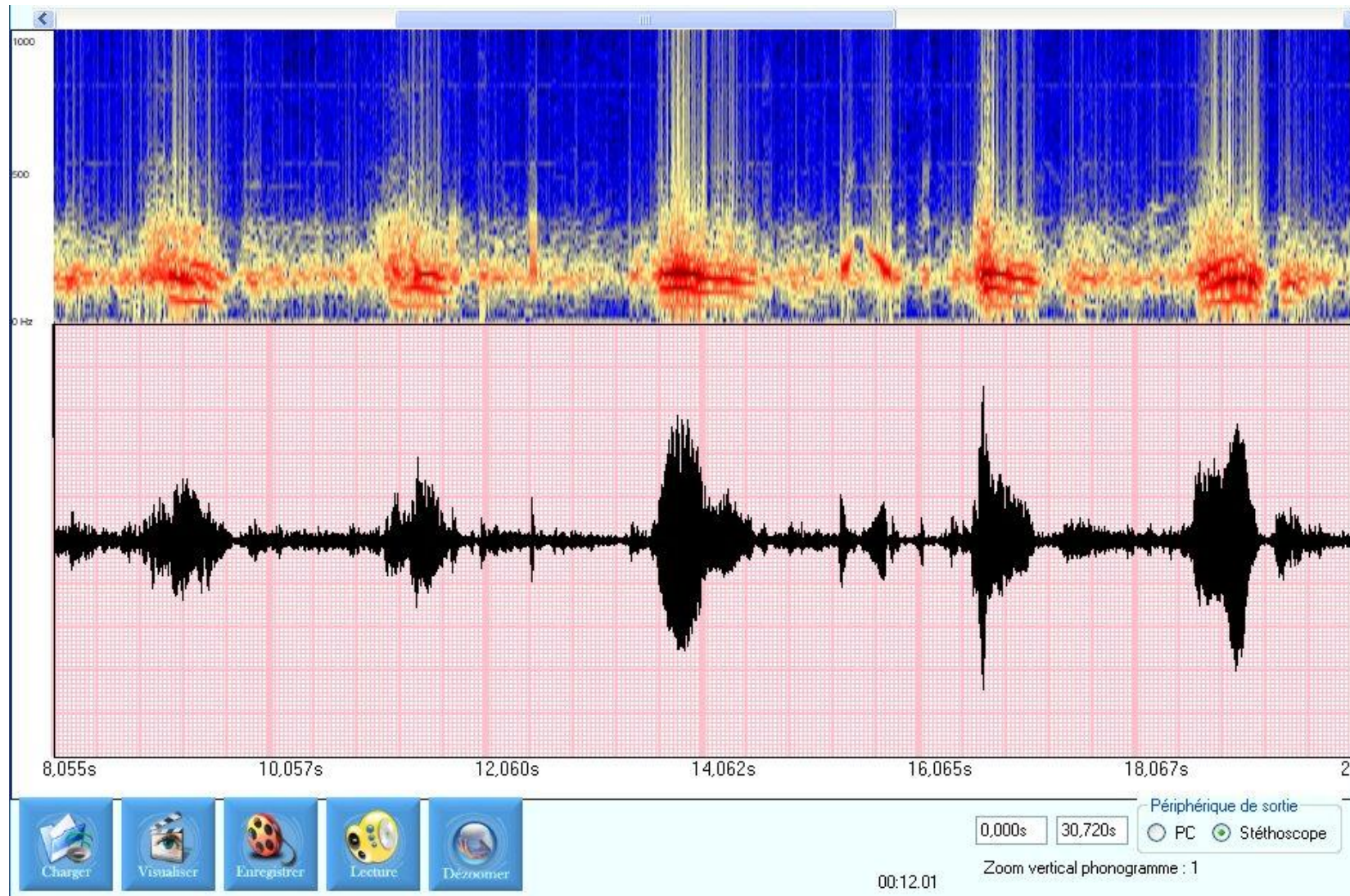


Aortic prosthetic valve (Medtronic Hall) plus Bental

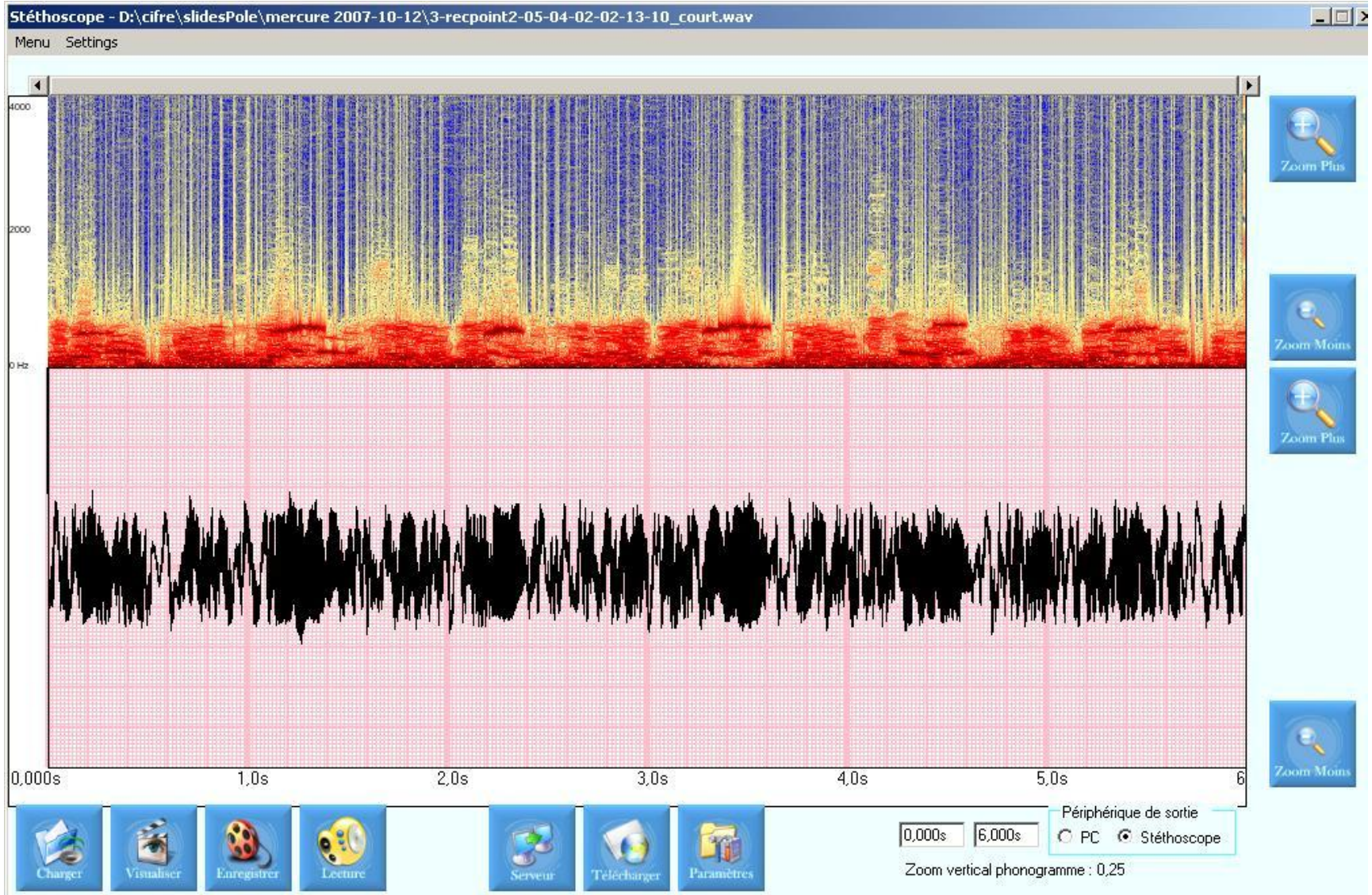




Mild COPD

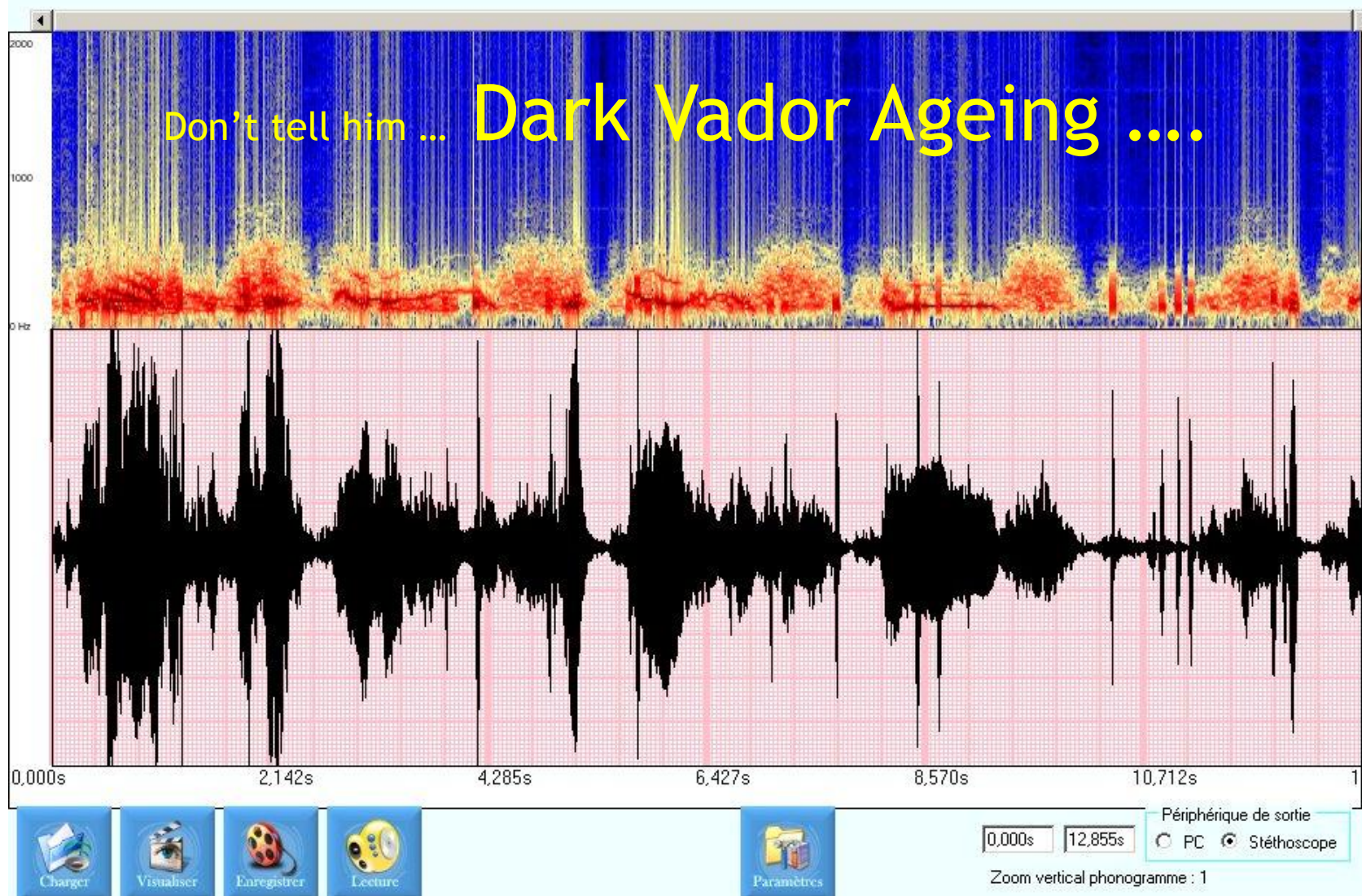


Pulmonary auscultation - bronchiolitis (ronchis and wheezes)





Pulmonary auscultation - COPD



What to expect from TELEAUSCULTATION in the next future?

On Earth :

- A new concept to practice Medecine abolishing distances between patients, doctors and even hospital
- Improvement of patient's survey at home
- Better decision making in emergency
- Better education of student's

And in Space !

- Project proposed for prolonged spatial missions (Mars500-ESA)

The background is a vibrant blue with a complex network of glowing white lines that curve and intersect, suggesting a global or data network. In the background, there are faint, semi-transparent images of server racks or data center equipment. In the top-left and bottom-right corners, there are clusters of small, dark blue dots arranged in a grid-like pattern.

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