بسم الله الرحمن الرحيم

An introduction to theoretical and practical foundations of bioresonance technology

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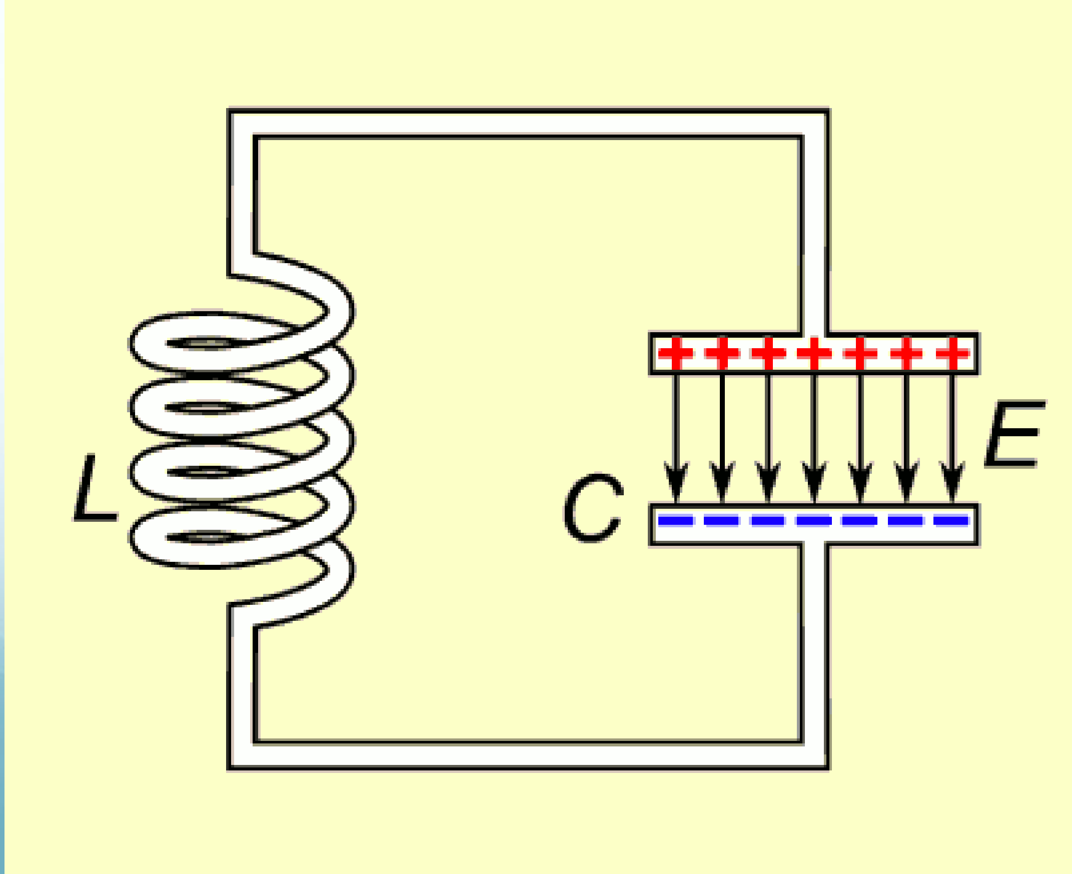
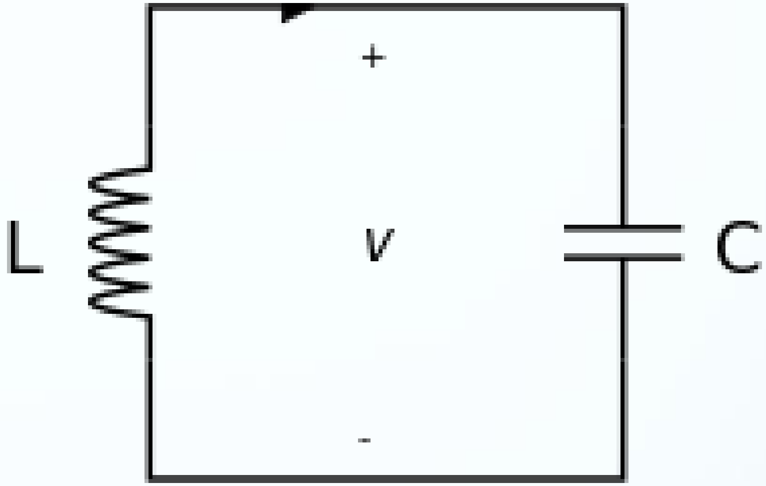
Types of Resonance

- There are several different types of resonance. These are
  - mechanical resonance,
  - acoustic resonance,
  - electromagnetic resonance,
  - nuclear magnetic resonance,
  - electron spin resonance
  - and bioresonance.

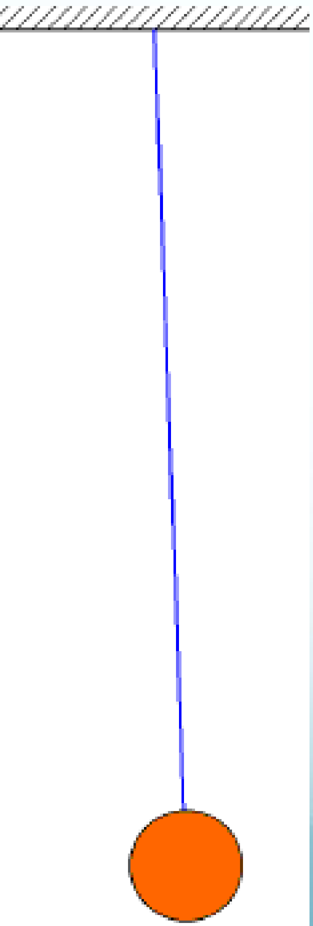
Diapason

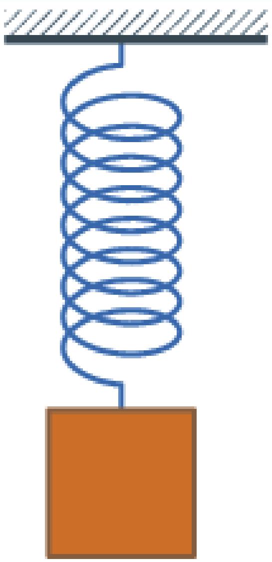
electromagnetic resonance

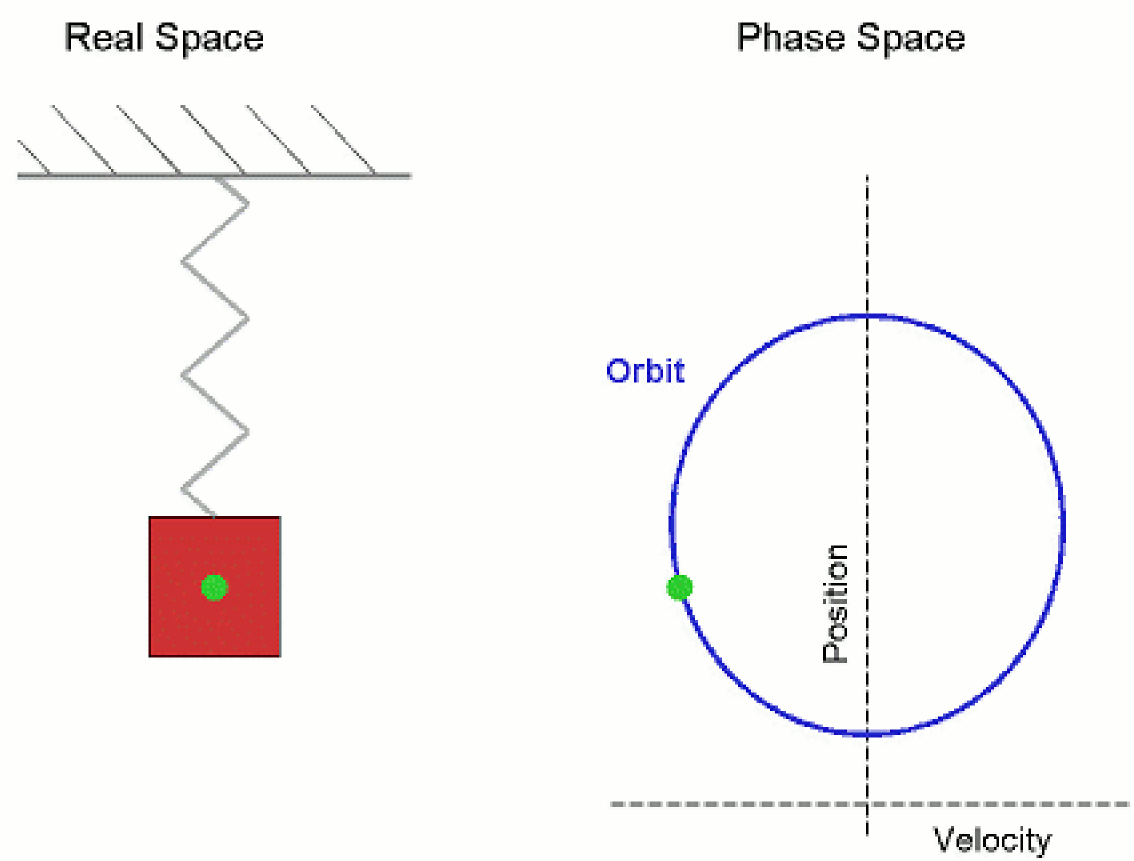




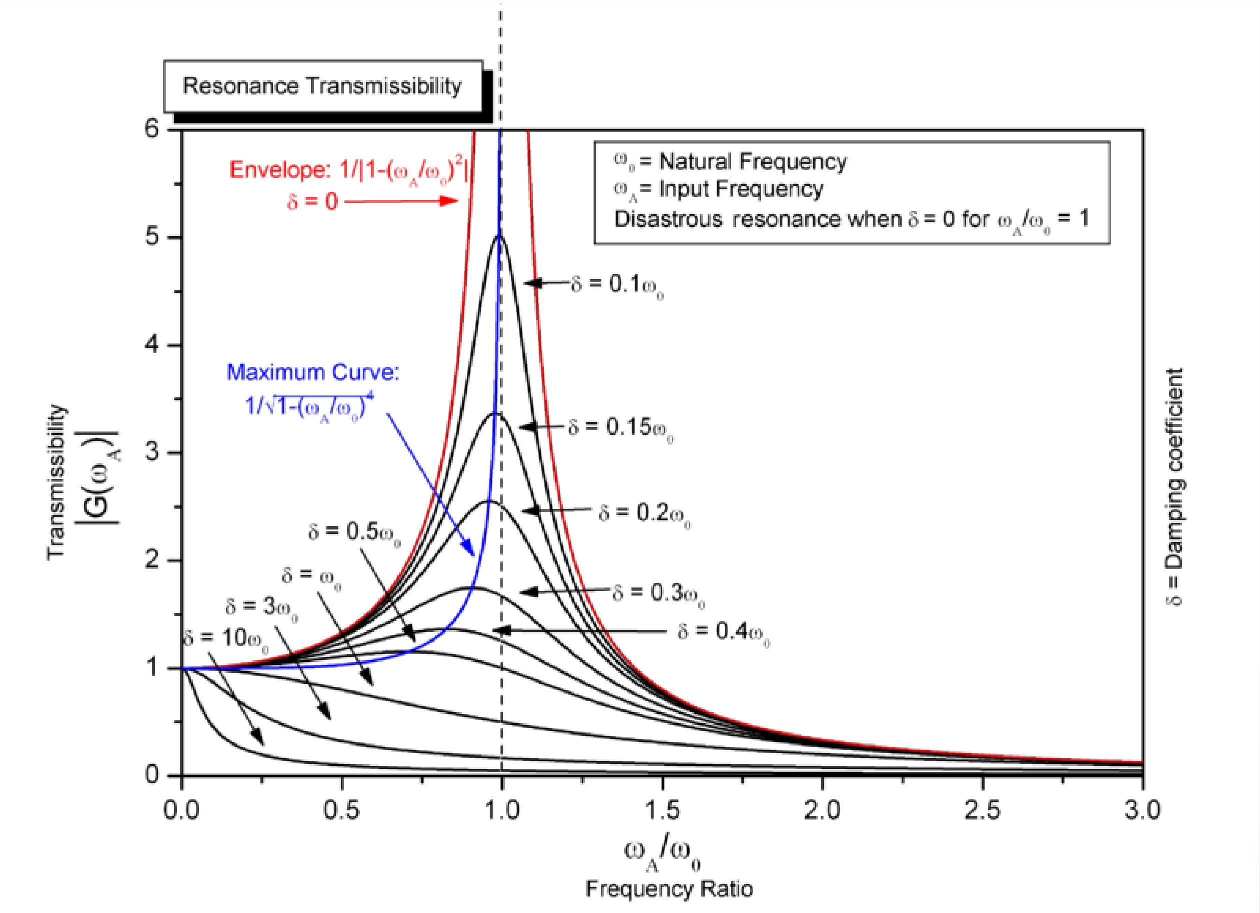
Linear oscillation





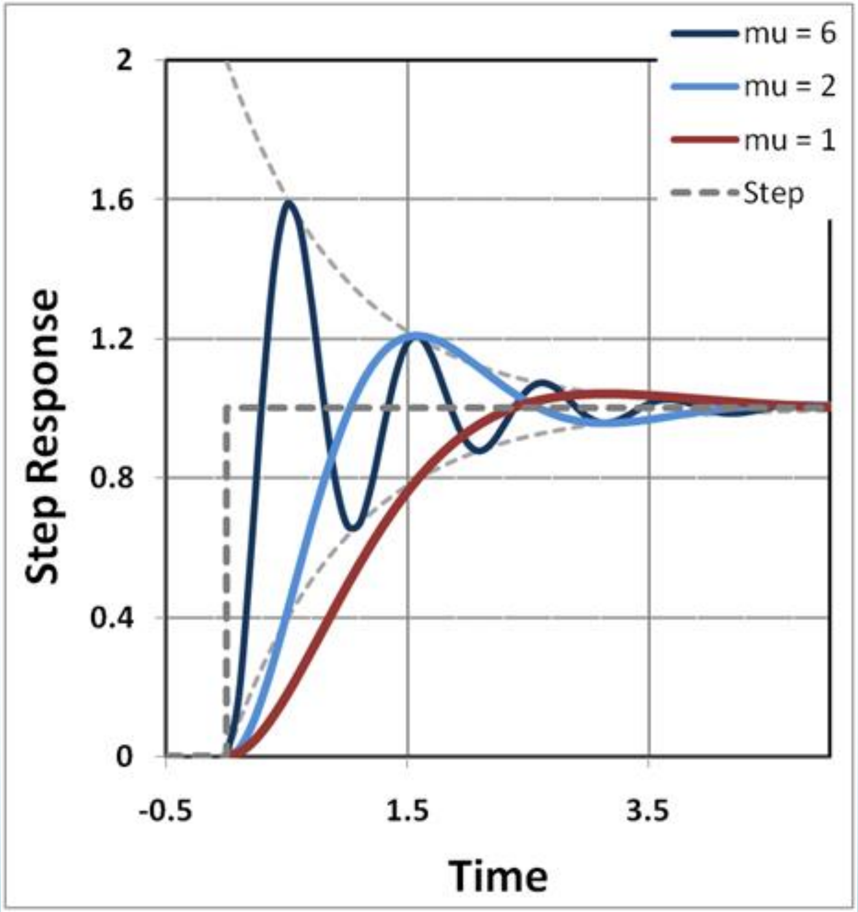


Q factor: frequency description

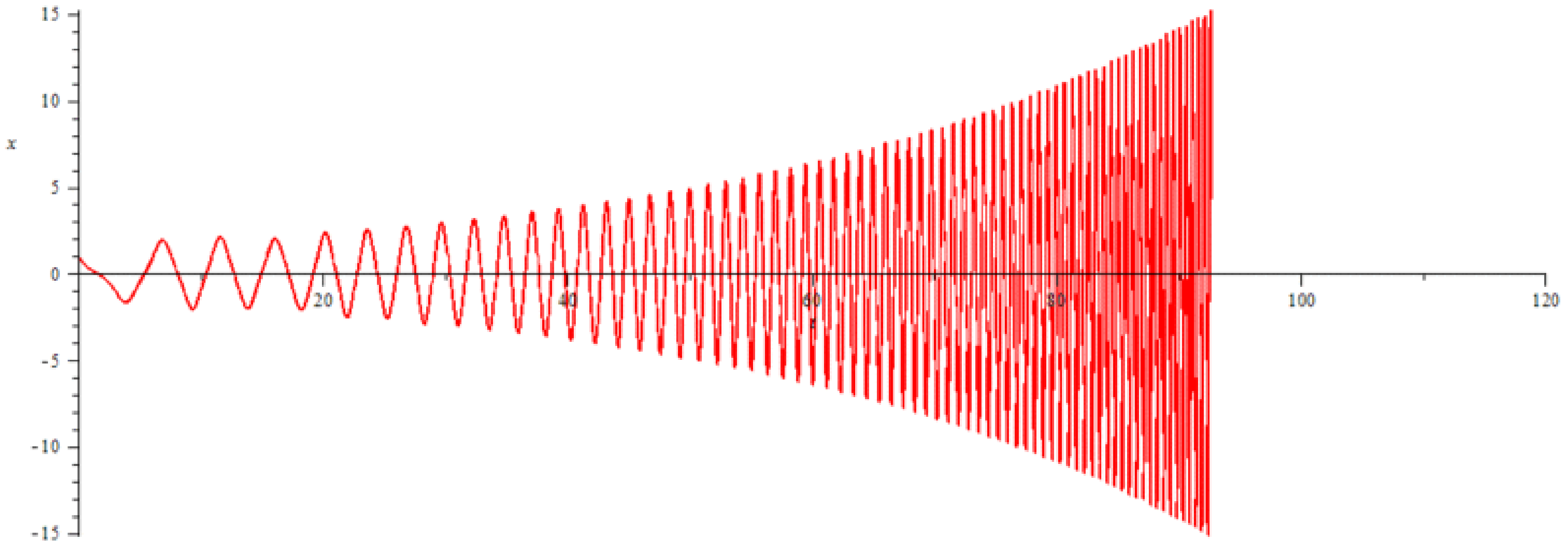


$$\frac{\mathrm{d}^2x}{\mathrm{d}t^2} + 2\zeta\omega_0\frac{\mathrm{d}x}{\mathrm{d}t} + \omega_0^2 x = \frac{1}{m}F_0\sin(\omega t),$$

Q factor: time description



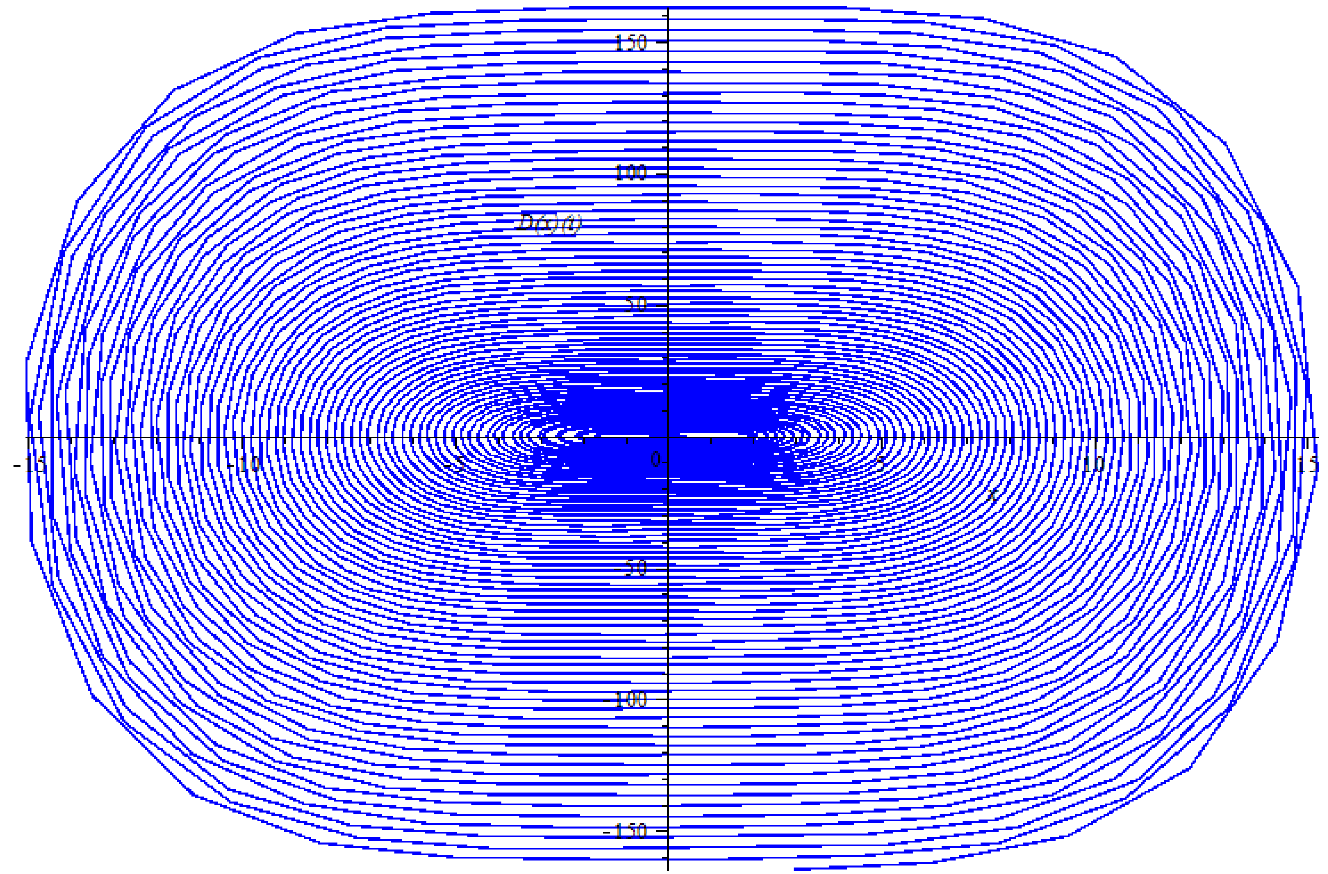
Nonlinear oscillation: Duffing oscillator in time



Duffing oscillator for gamma=0.04

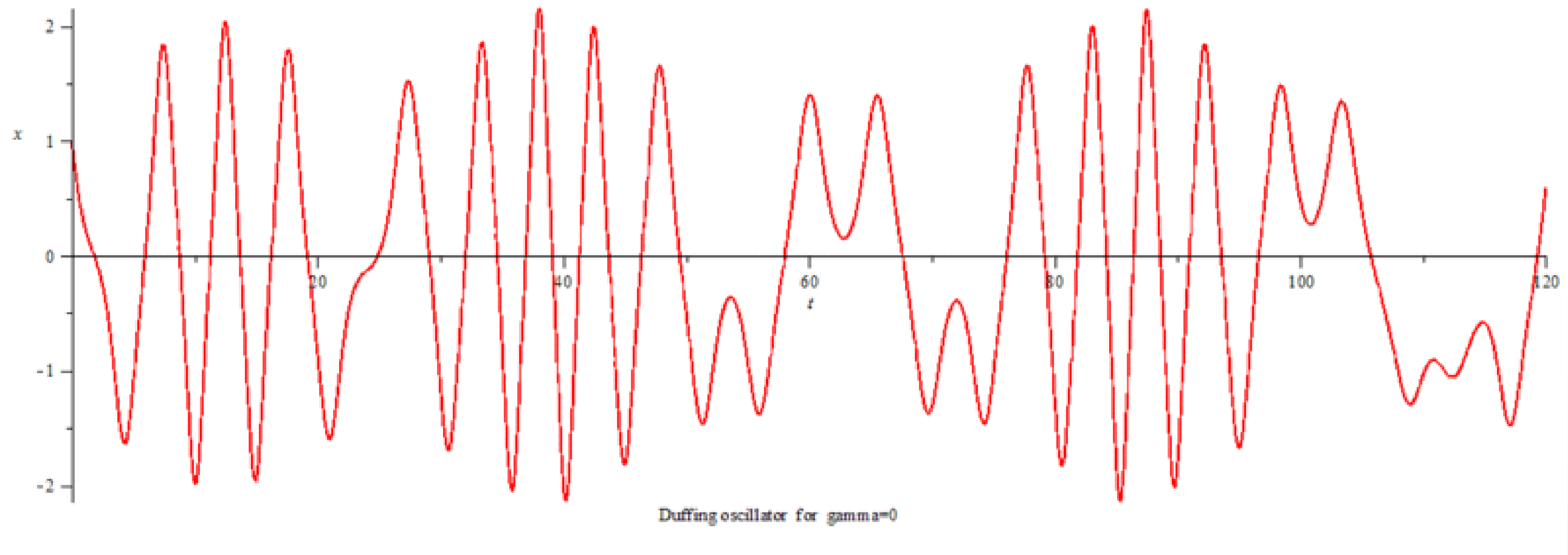
$$\ddot{x} + \delta\dot{x} + \alpha x + \beta x^3 = \gamma\cos(\omega t)$$

Nonlinear oscillation: Duffing oscillator in phase space



Duffing oscillator x,x' phase diagram for gamma=0.04

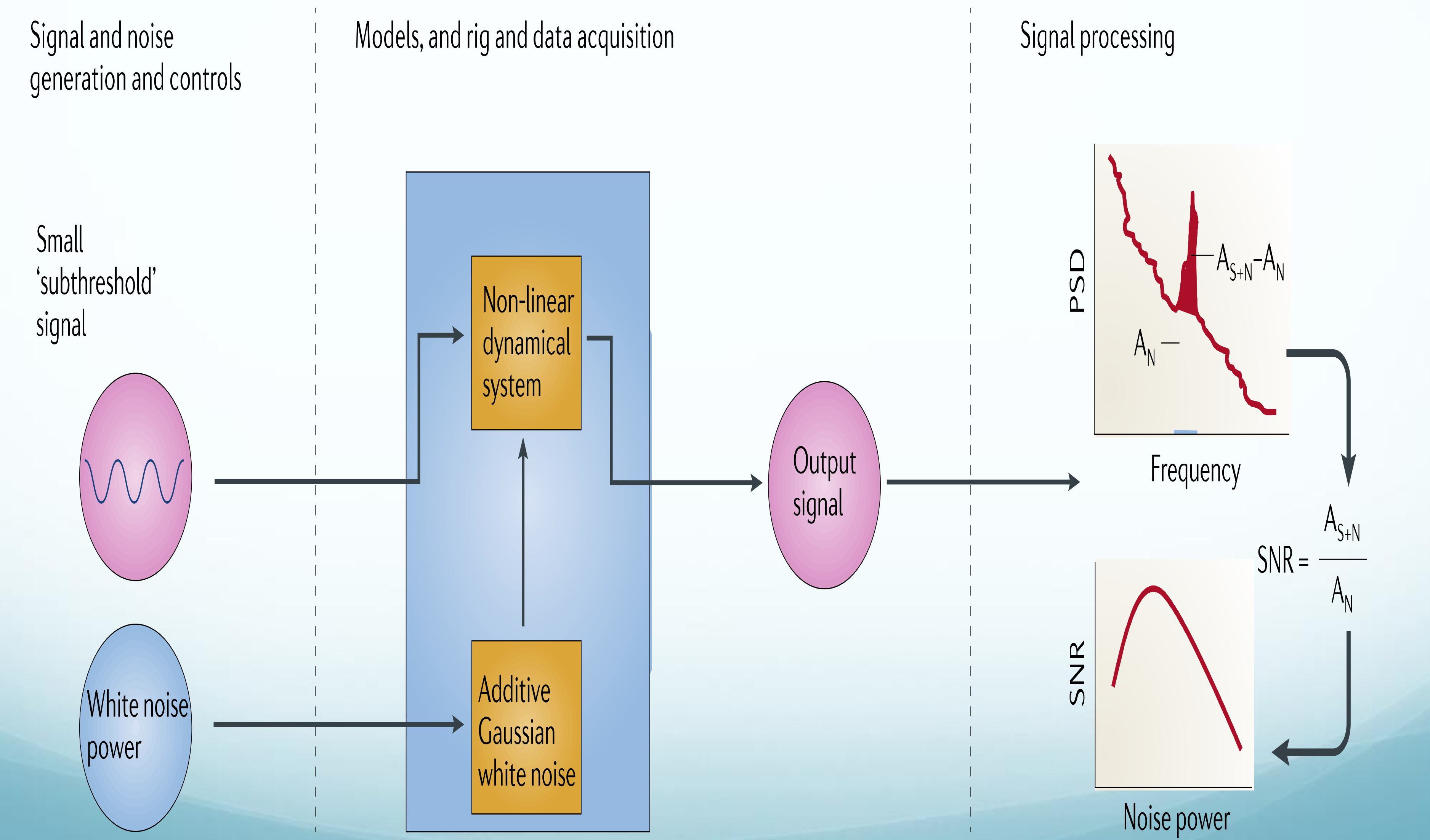
Chaotic behavior of Duffing equation



Stochastic resonance

- **Stochastic resonance (SR) is a phenomenon where a signal that is normally too weak to be detected by a sensor, can be boosted by adding white noise to the signal, which contains a wide spectrum of frequencies. The frequencies in the white noise corresponding to the original signal's frequencies will resonate with each other, amplifying the original signal while not amplifying the rest of the white noise (thereby increasing the signal-to-noise ratio which makes the original signal more prominent). Further, the added white noise can be enough to be detectable by the sensor, which can then filter it out to effectively detect the original, previously undetectable signal.**

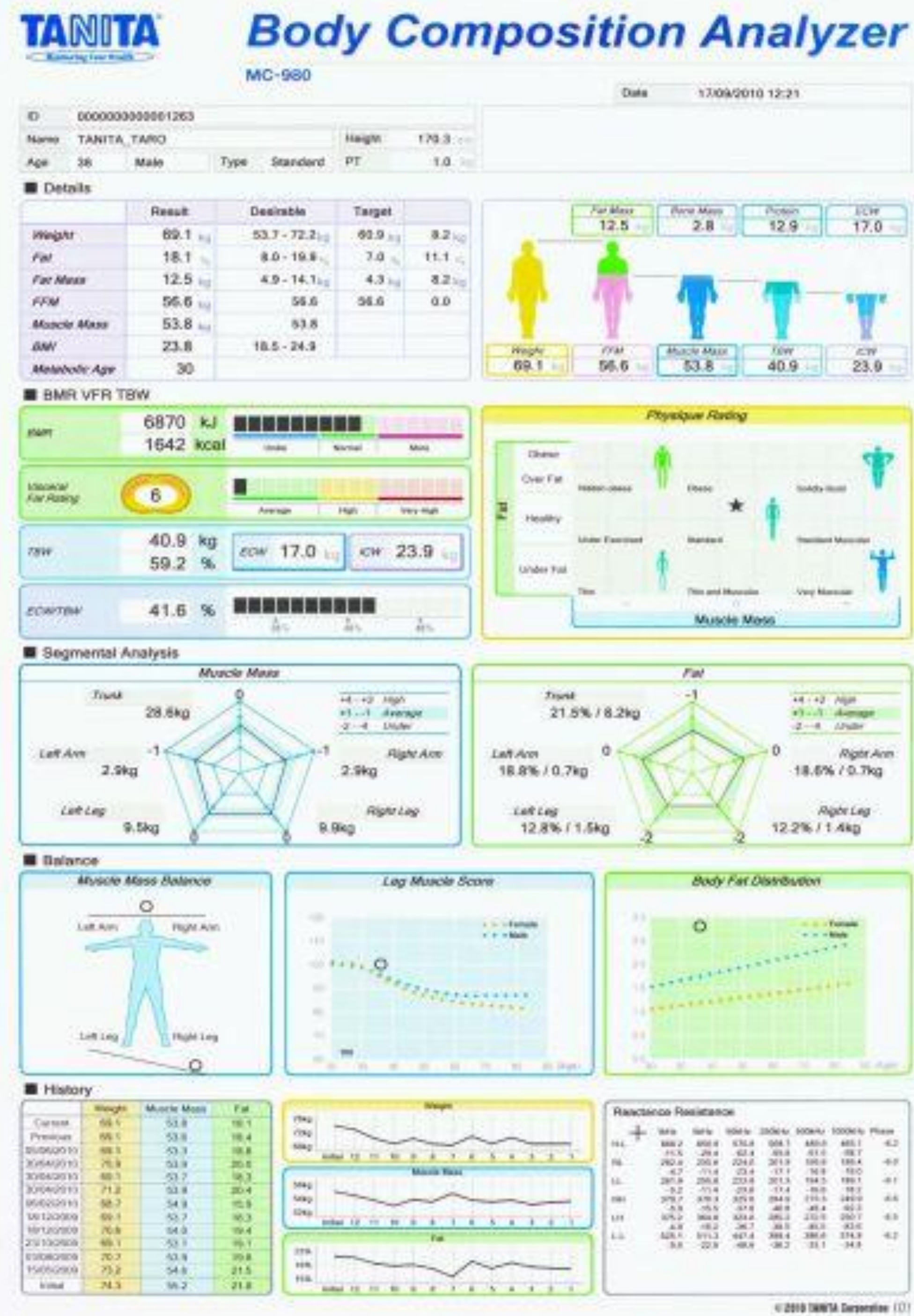
a Classical stochastic resonance



- **Stochastic resonance has been observed in the neural tissue of the sensory systems of several organisms.Computationally, neurons exhibit SR because of non-linearities in their processing. SR has yet to be fully explained in biological systems, but neural synchrony in the brain (specifically in the gamma wave frequency) has been suggested as a possible neural mechanism for SR by researchers who have investigated the perception of "subconscious" visual sensation.**

Available technology based electromagnetic approach

- Body composition analyzer
  - Multi frequency bio-electrical impedance analysis



TANITA

Body Composition Analyzer

MC-980

Date	17/09/2010 12:21

ID	0000000000001263				
Name	TANITA_TARO			Height	170.3 cm
Age	36	Male	Type Standard	PT	1.0 kg

■ Details

	Result	Desirable	Target	
Weight	69.1 kg	53.7 - 72.2 kg	60.9 kg	8.2 kg
Fat	18.1 %	8.0 - 19.9 %	7.0 %	11.1 %
Fat Mass	12.5 kg	4.9 - 14.1 kg	4.3 kg	8.2 kg
FFM	56.6 kg	56.6	56.6	0.0
Muscle Mass	53.8 kg	53.8		
BMI	23.8	18.5 - 24.9		
Metabolic Age	30			

Fat Mass 12.5 kg · Bone Mass 2.8 kg · Protein 12.9 kg · ECW 17.0 kg
Weight 69.1 kg · FFM 56.6 kg · Muscle Mass 53.8 kg · TBW 40.9 kg · ICW 23.9 kg

■ BMR VFR TBW

BMR 6870 kJ / 1642 kcal

Visceral Fat Rating 6

TBW 40.9 kg / 59.2 % — ECW 17.0 kg — ICW 23.9 kg

ECW/TBW 41.6 %

Physique Rating

■ Segmental Analysis

Muscle Mass: Trunk 28.6kg · Left Arm 2.9kg · Right Arm 2.9kg · Left Leg 9.5kg · Right Leg 9.9kg

Fat: Trunk 21.5% / 8.2kg · Left Arm 18.8% / 0.7kg · Right Arm 18.6% / 0.7kg · Left Leg 12.8% / 1.5kg · Right Leg 12.2% / 1.4kg

■ Balance

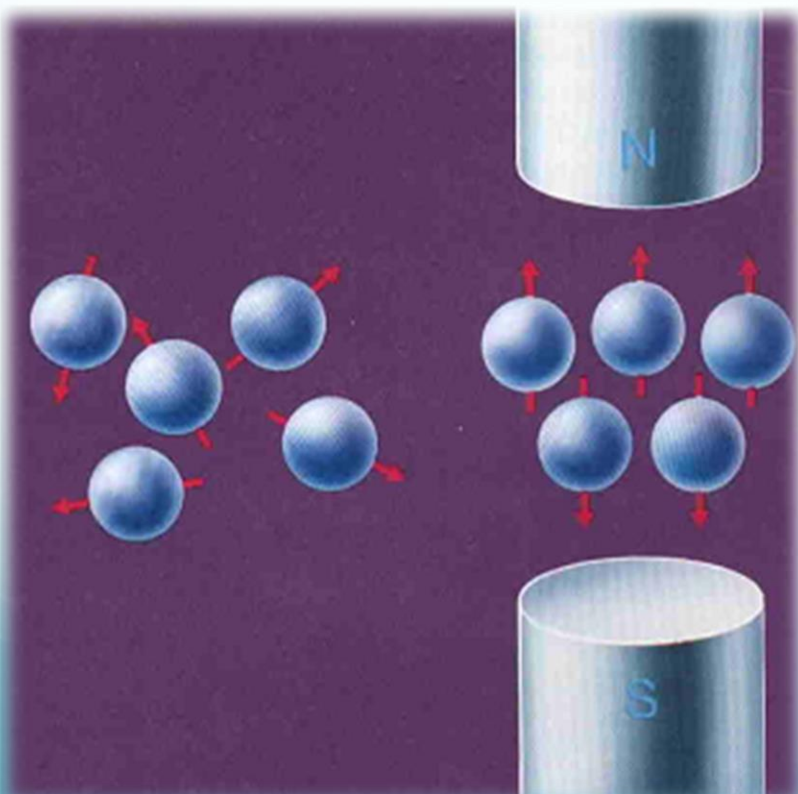
Muscle Mass Balance · Leg Muscle Score · Body Fat Distribution

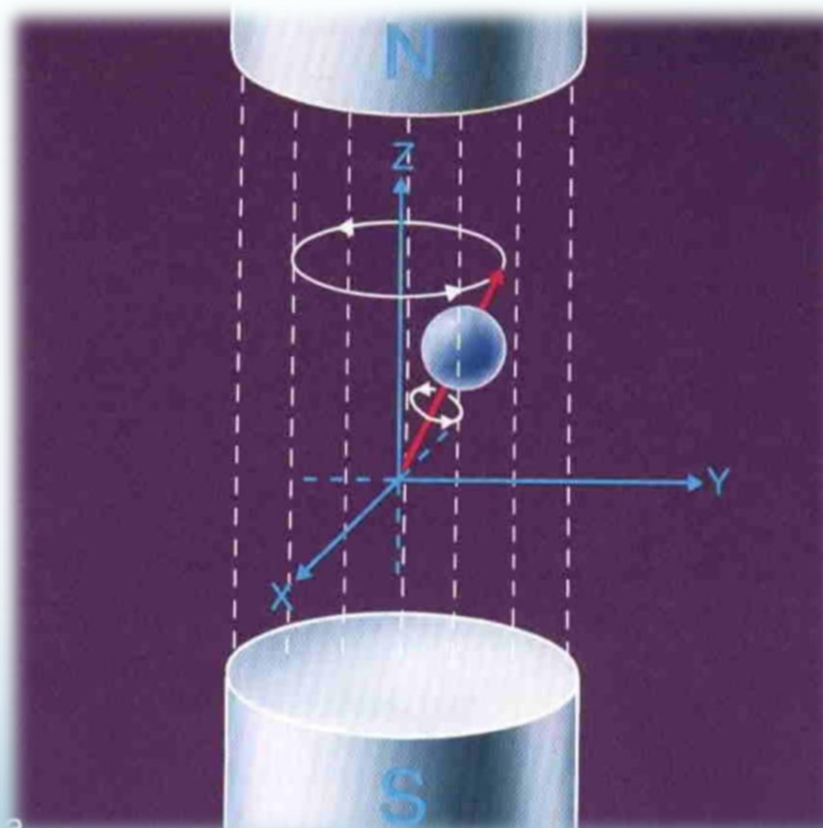
■ History

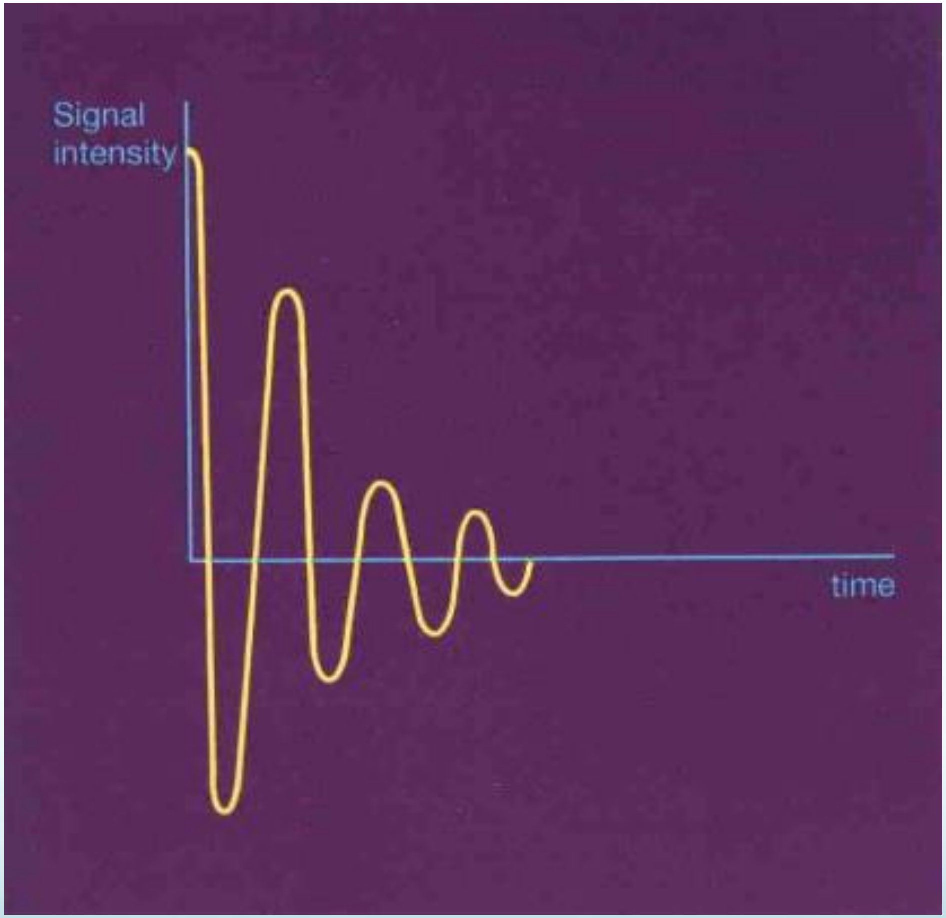
	Weight	Muscle Mass	Fat
Current	69.1	53.8	18.1
Previous	69.1	53.8	18.4
05/06/2010	69.1	53.3	18.8
30/04/2010	70.9	53.9	20.6
30/04/2010	69.1	53.7	18.3
30/04/2010	71.2	53.8	20.4
05/02/2010	68.7	54.9	15.9
18/12/2009	69.1	53.7	18.3
18/12/2009	70.8	54.0	19.4
23/10/2009	69.1	53.1	19.1
03/08/2009	70.7	53.9	19.8
15/05/2009	73.2	54.8	21.5
Initial	74.3	56.2	21.8

Reactance Resistance

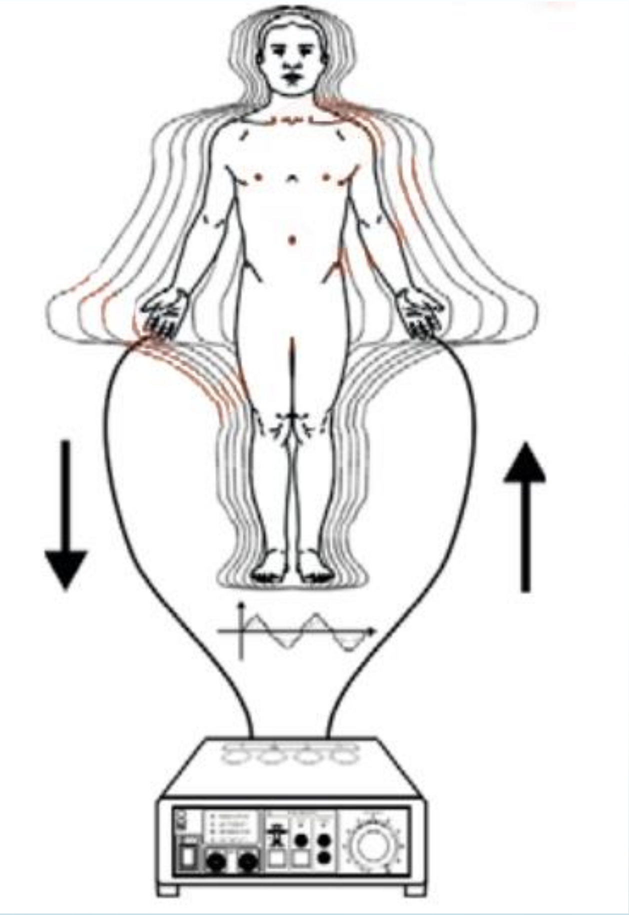
- MRI(Magnetic Resonance Imaging)






Signal
intensity
time

New technology:Bioresonance



Two type responses

The mechanism of therapeutic action as formulated by Dr. (med.) F. Morell is based on the assumption that there are two types of electrical oscillation in living organisms: "physiological" or harmonious, and "pathological" or disharmonious oscillations. In most BRT literature the "physiological" signals are usually depicted as a sinusoidal wave form and "pathological" signals are illustrated as far more complex signals (4, 5, 7, 10, 11).

The resonant frequency for the whole human body and its individual organs have been established only for mechanical vibrations in the infrasonic and low frequency bands of the audio field – 2–400 Hz (34). For example, the resonant frequency for mechanical vibration of a seated person is 4–6 Hz, the abdomen 4–12 Hz, the head 8–27 Hz, the eye 12–27 Hz, etc. In principle mechanical resonance can be observed at the level of individual cells, for example bacterial cell in vitro (35). This phenomenon has also been termed "biological resonance" although it refers only to the response to mechanical vibrations (36).

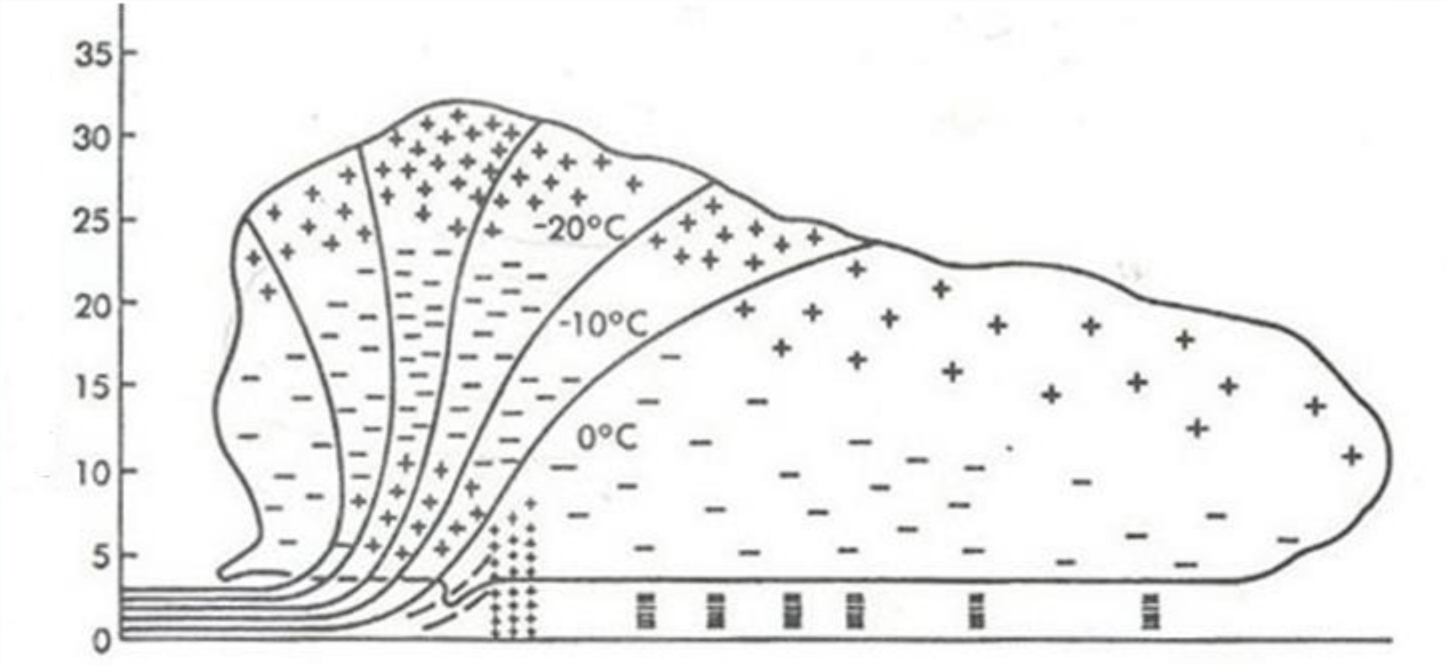
The existence of resonance frequencies (in the physical sense) for low frequency electric or electromagnetic fields in biological environments or in biological objects has not been established experimentally (37). This is because of the large attenuation of an alternating electrical field in biological media. For example, taking a mechanical analogy, if we compare the oscillations of a pendulum in a viscous medium such as water and compare it with a pendulum free to oscillate in air we will observe that in the first case the oscillations will be significantly weakened (attenuated) compared to the second example. The reciprocal of the decay rate is the quality or Q factor of the oscillatory system which should be sufficiently large in order to obtain a meaningful resonance effect. The Q factor is a measure of selectivity and when the value is high the signal is selected and amplifies the signal in resulting in a large amplitude of the resonance peak.

The majority of BRT instruments work in a range of 10 Hz – 150 kHz which means that there cannot be a high Q factor in biological objects at these frequencies.

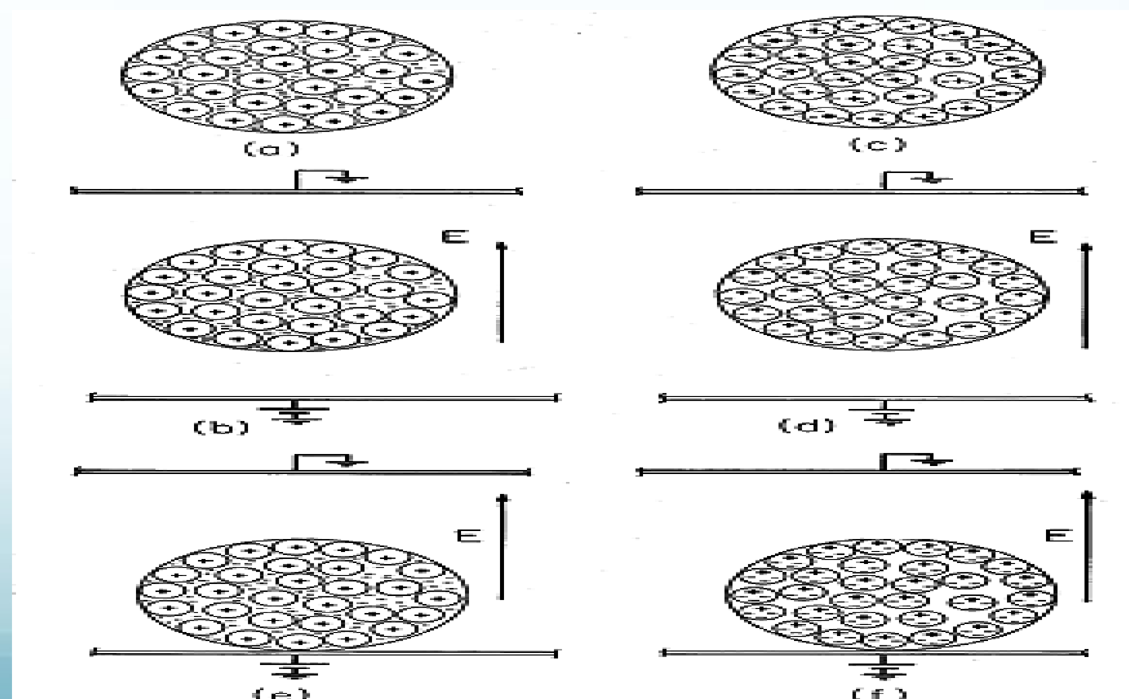
Fundamentally different effects are observed at the microscopic level, where the mechanisms of interaction of electromagnetic fields are described by the classical theory of dielectrics (40).

Relaxation polarization is determined by the inertia of motion of charges in an alternating electric field and the time in which polarization occurs, i.e. the movement of a free charge or of a dipole from one position to another. There are three basic types of relaxation polarization in biological environments: structural; interlayer polarization (structural polarization of the interfaces); and dipole polarization.

A biological object is a dielectric with losses due to the presence of free and bound charges, which can be moved or guided by an alternating electric field. In biological objects conduction currents flow arising mainly as a result of movement of free charges in the form of ions in cells and tissues. The appearance of bias currents is due to the orientation under the influence of an external electric field of bound charges in the form of dipoles, which can be water molecules, amino acids, or proteins. The process of changing the location of a charge in an electric field is the polarization of the biological object. Movement of the free or bound charges does not occur instantaneously, but takes time known as the relaxation time which is the time during which polarization takes place and is a characteristic of the mechanism of electromagnetic interactions in biological objects. In general terms there are two fundamentally different types of polarization in all biological objects: relaxation and resonance polarizations (41).



35
30
25
20
15
10
5
0
-20°C
-10°C
0°C



(a)
(c)
E
(b)
(d)
(e)
(f)

Structural polarization takes place due to the presence of macroscopic structural formations (inclusions) in biological objects, where there is an accumulation of charge on their borders. In this case, the structural formation-inclusion, gains an induced dipole moment in the electric field and behaves like a giant dipole. Since structural polarization is characterized by a greater time compared to other types of relaxation time, then energy absorption from the electric field will occur at lower frequencies - from 0.01 Hz to 10 kHz.

Polarization at the interfaces takes place because of the restriction of movement of charges as a result of irregularities in the structure of biological objects within the same area. Such restrictions of the movement of, for example, extracellular and intracellular ions arise from the presence of cell membranes. If the relaxation time is close to or coincides with the frequency change of the external electric field, then it absorbs its energy. The polarization of the interfaces is characterized by a range of frequencies from 10 kHz to 10 MHz.

Dipole polarization arises from the orientation of dipole molecules in the direction of the electric field. The dipole molecules are chaotically arranged without the presence of an electric field The magnitude of their oscillation is determined by temperature. In the presence of an alternating electric field dipole molecule starts to oscillate around the axis of the field and, as it approaches its frequency to the time orientation (relaxation), then it goes into vibrational motion. The degree of orientation of polar molecules with a further increase of the frequency of the electric field again decreases, and then the molecule is no longer capable of orientation. Dipole polarization occurs at frequencies above 10–100 MHz up to 20 GHz.

During resonance, polarization molecules, ions or atoms become dipoles only in the presence of an electric field and disappear in its absence. These dipole moments are induced and cause electronic and atomic polarization of molecules, which have no permanent dipole moment. Only for this type of polarization do resonance interactions occur at frequencies above 10^{11} Hz.

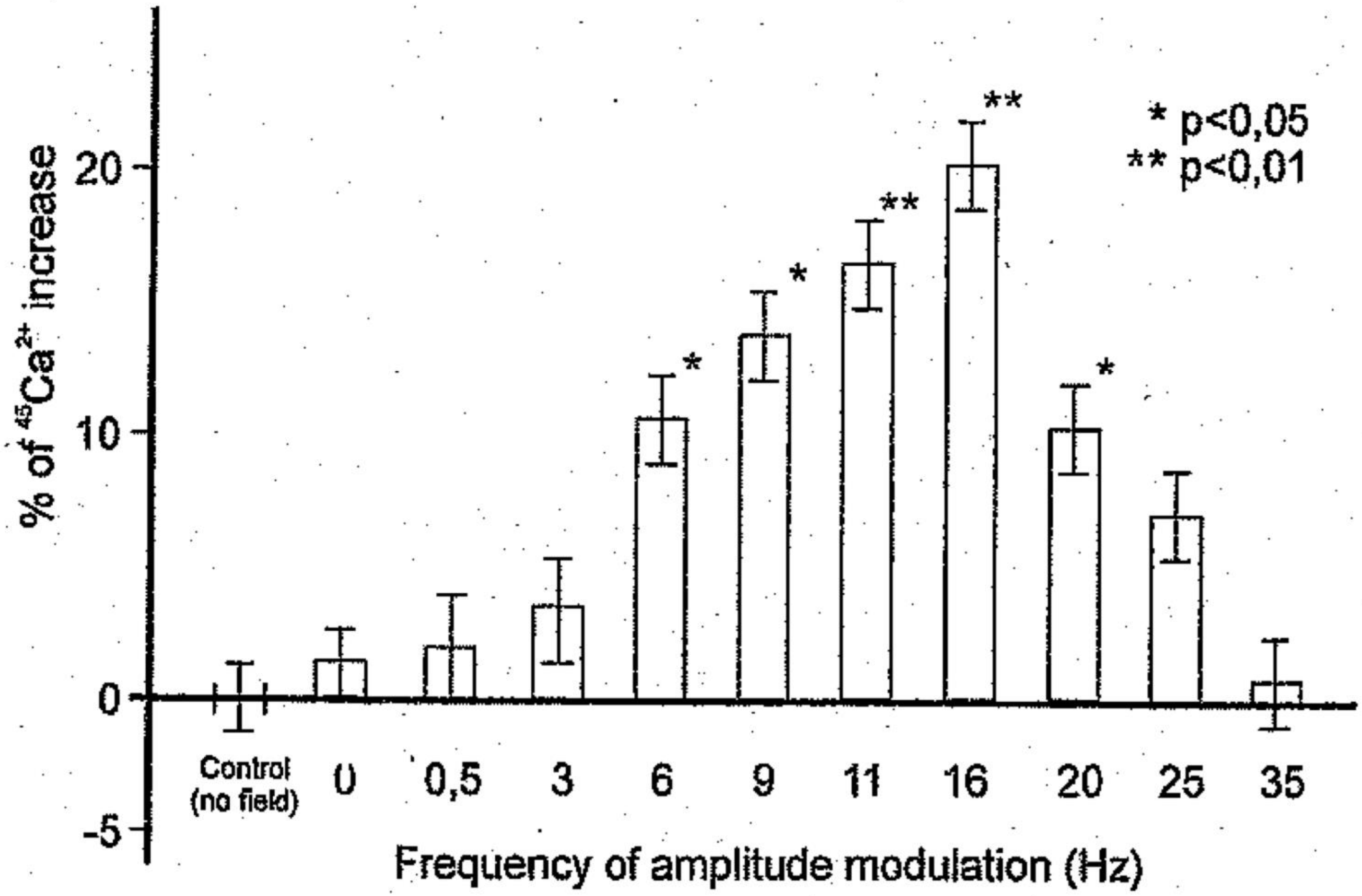


Fig. 4. The influence of an amplitude modulated electromagnetic field on the extraction of $^{45}Ca^{2+}$ ions from an isolated chicken brain (in % compared with the control). On the x-axis - modulation frequency Hz (48).

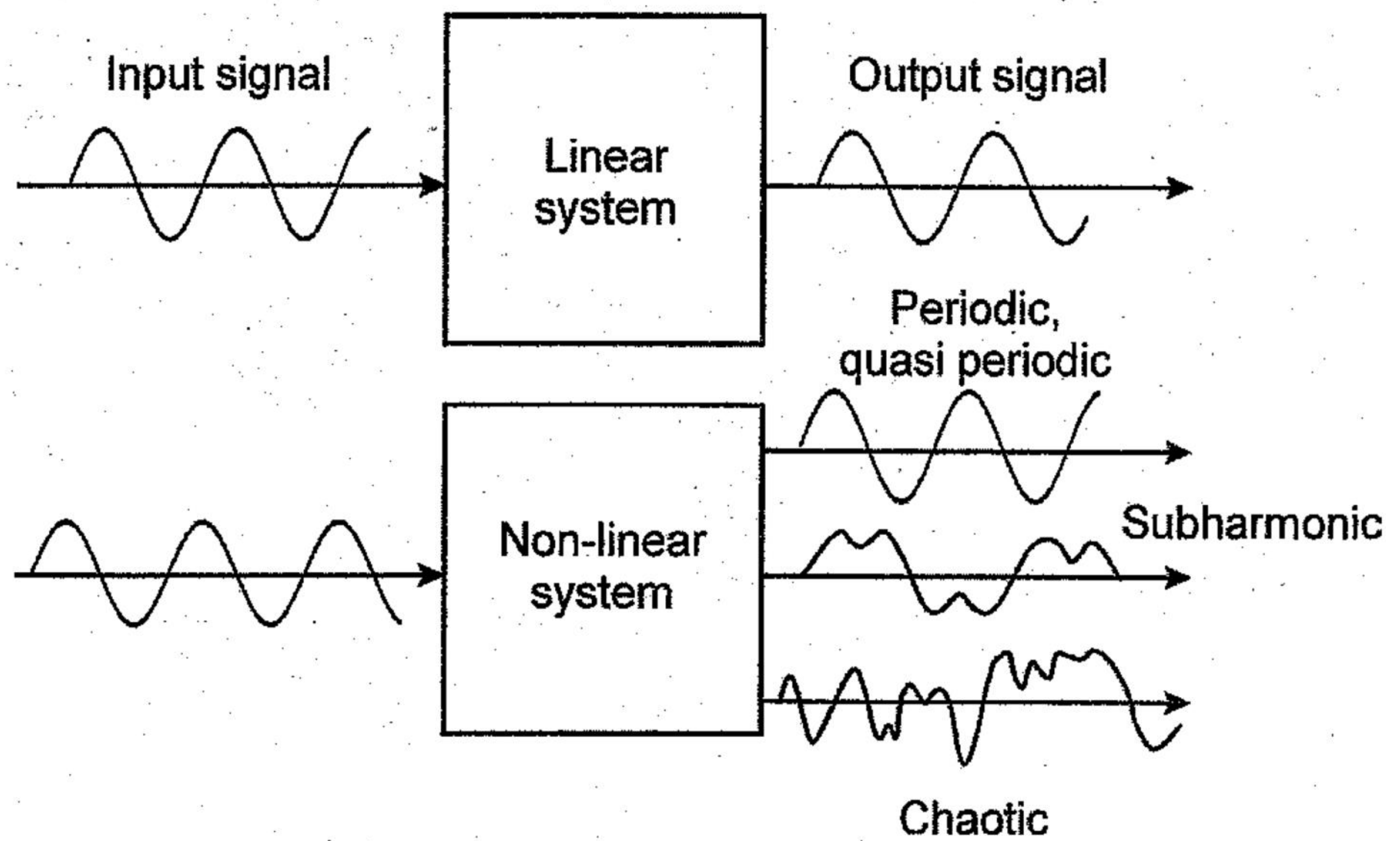
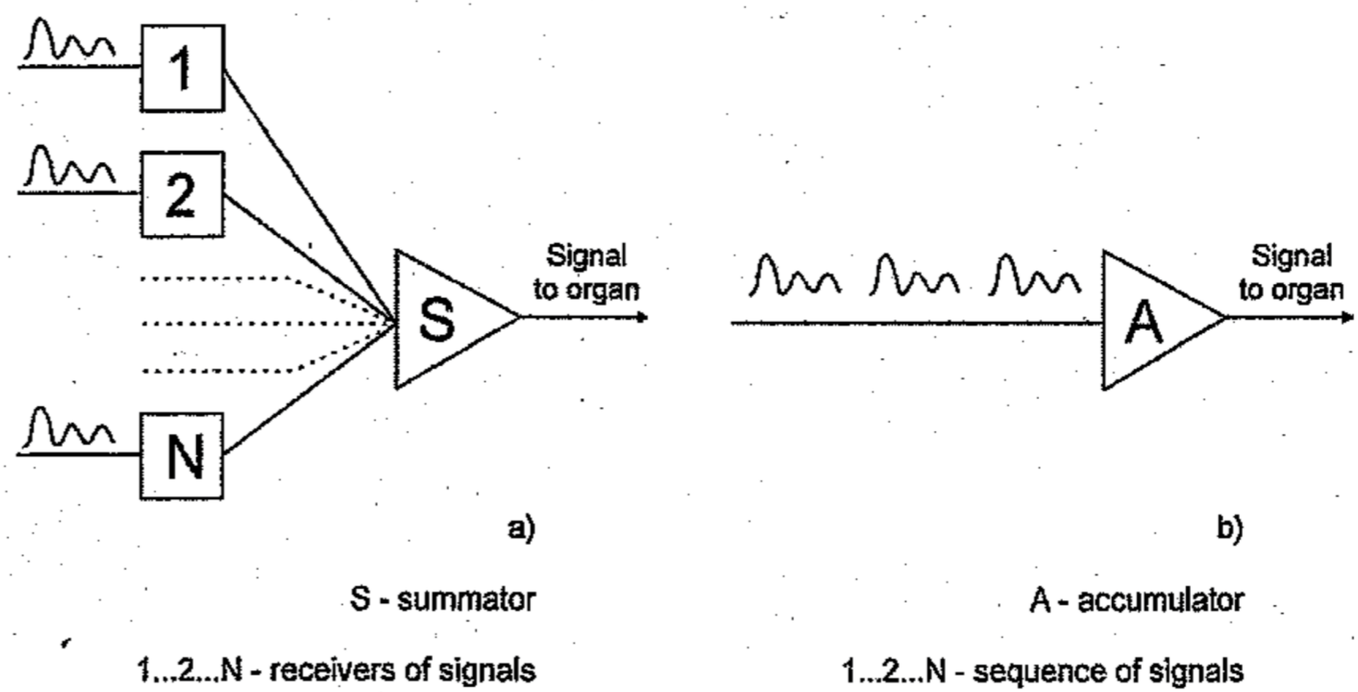


Fig. 6. Scheme of signal conversion in linear and nonlinear systems (62).



7. Schematic representation of the general principles of spatial (a) and temporal (b) summation of informational signals (86).

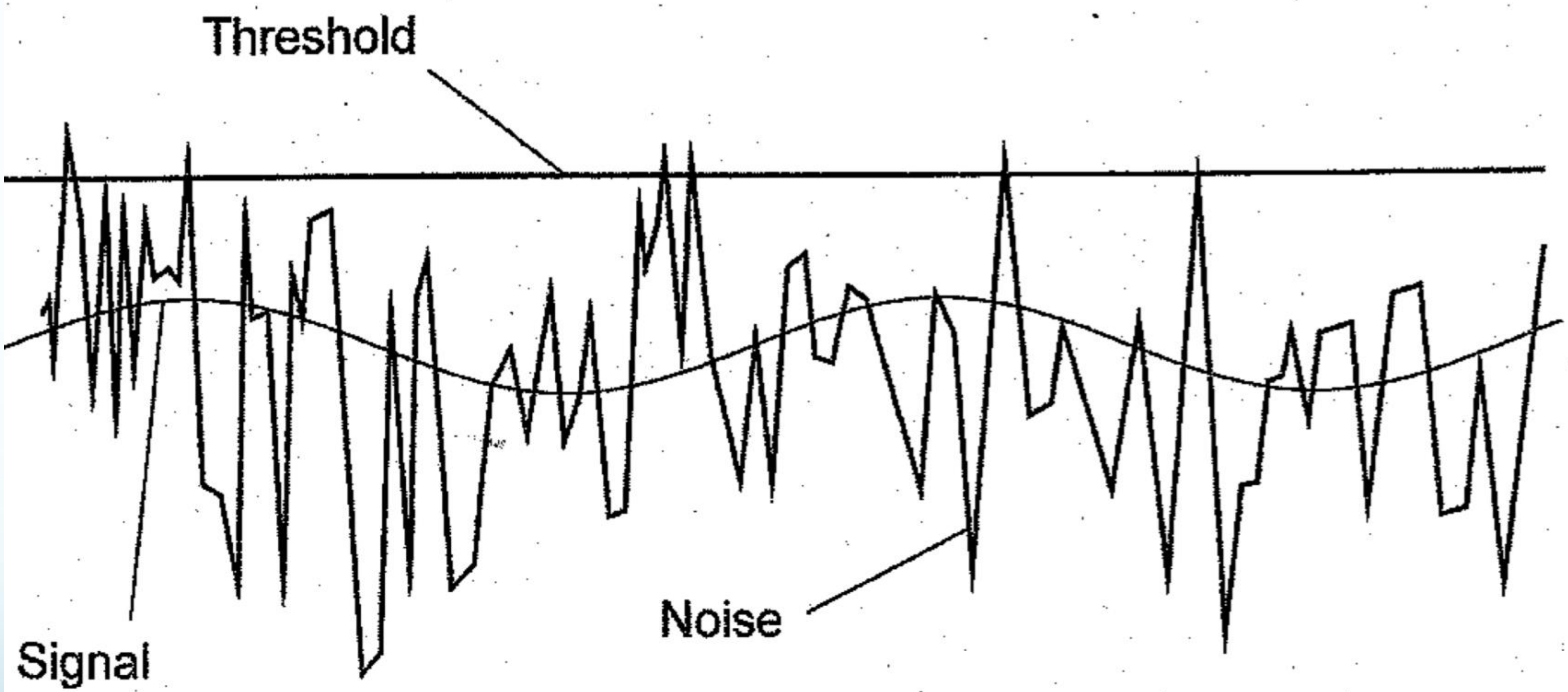


Fig. 8. The basic principle of stochastic resonance (87).

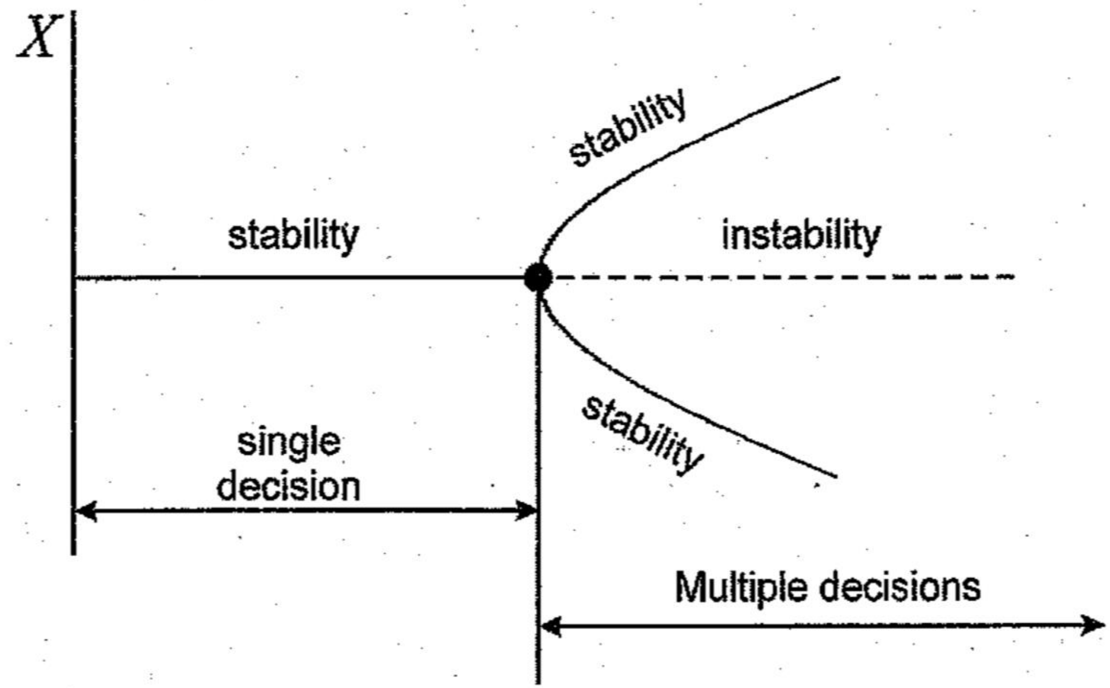
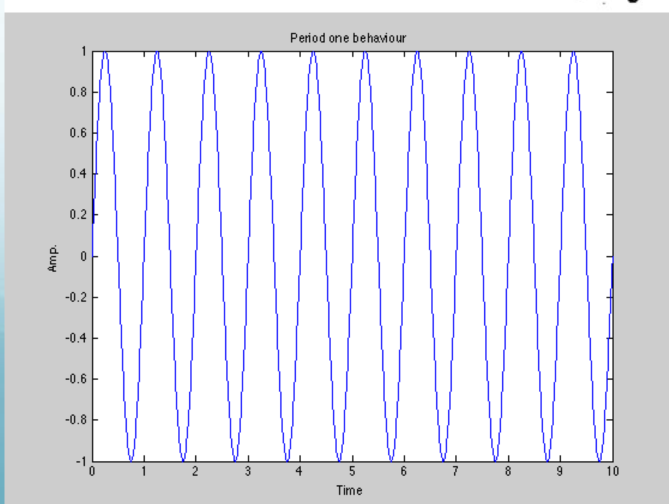
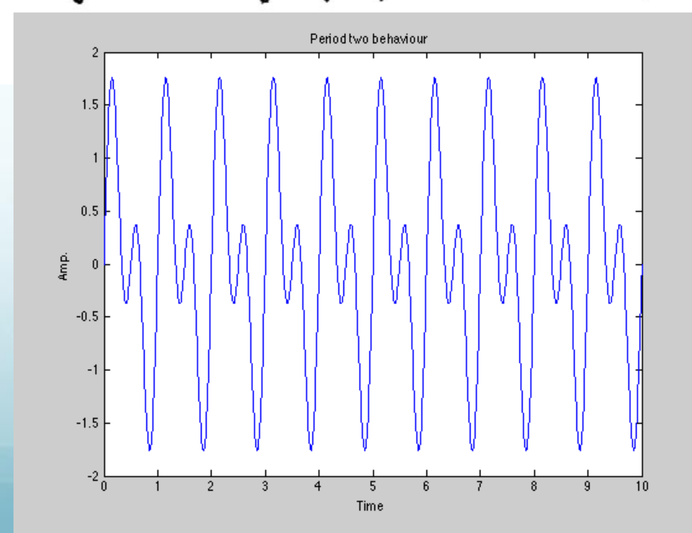


Fig. 9. Bifurcation diagram of non-equilibrium systems, reflecting transitions "stability -instability-stability" (65).





With endogenous BRT, electrical oscillations are picked up by means of electrodes placed on the skin which are connected by a cable to the BRT apparatus. These signals are then processed and amplified and returned back to the patient (as a closed feedback loop) (Fig. 2).

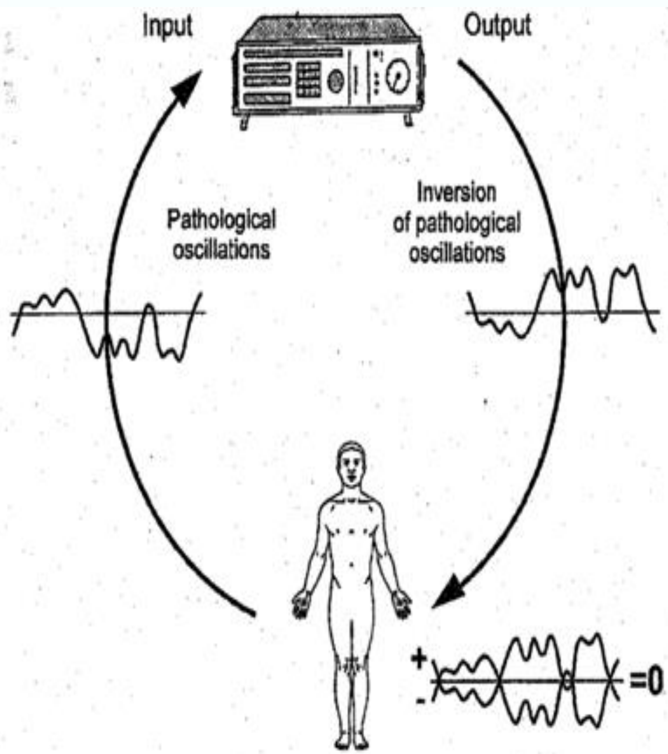


Fig. 2. Registration and processing of patient's electric oscillation via device for bioresonance therapy (5).

With exogenous BRT, therapy is accomplished via electrical frequencies or by the application of external electromagnetic fields using fixed frequencies or frequencies that have been empirically selected and clinically tested. This form of BRT uses electrical signals generated by the BRT apparatus which are not the result of processing the patient's own signals. The therapeutic electrical signals are applied to the body via electrically conductive electrodes, or, in the case of magnetic signals, via magnetic therapeutic devices such as magnetic inductors. The exogenous BRT signals (magnetic or electrical) are directed directly to specific organs or tissue systems in order to obtain a therapeutic effect.

It seemed obvious, then, that the human body broadcasts electrically, just like a radio station, but over a wide band of frequencies and very low voltages, which is why it has not been detected and measured until now.

Everything Has A Unique Frequency

The human range is from 1520 KHz to 9460 KHz. Pathogens (molds, viruses, bacteria, worms, mites) range from 77 KHz to 900 KHz. Fortunately for us we can work on zapping pathogens in the lower ranges without affecting humans in the upper range.

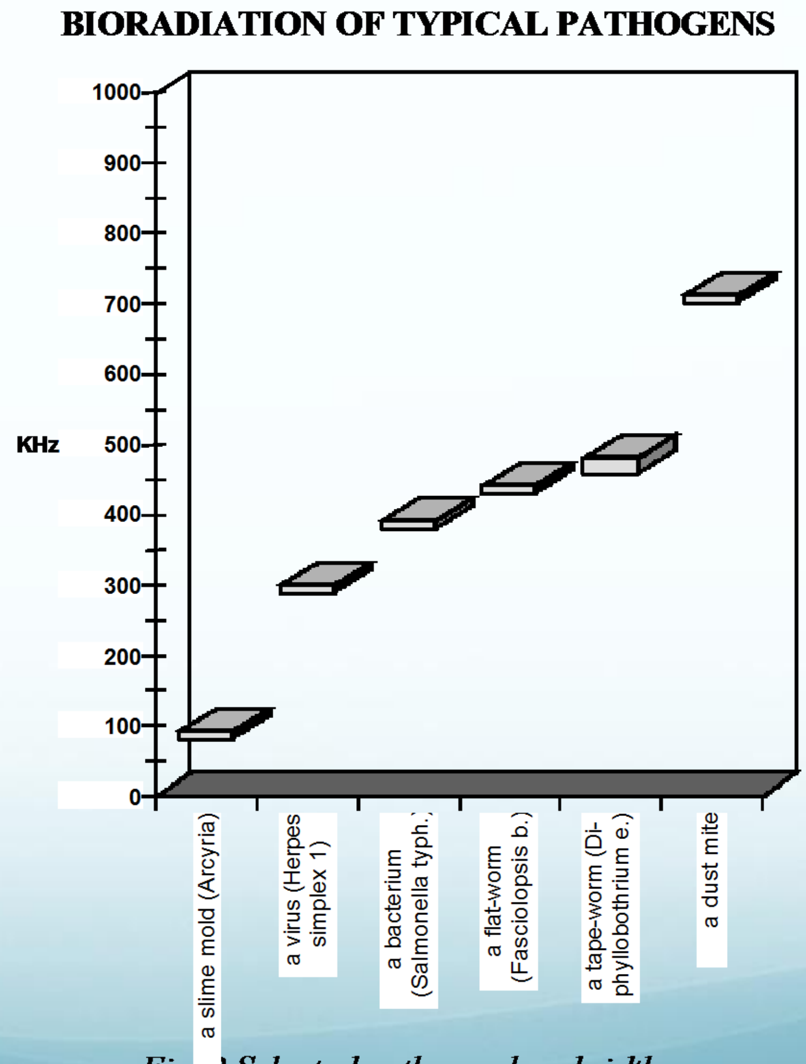
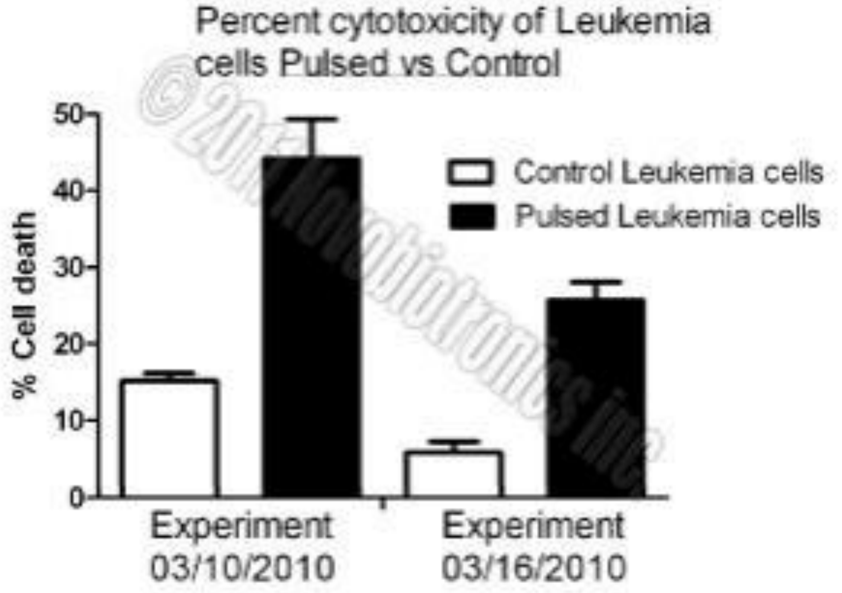
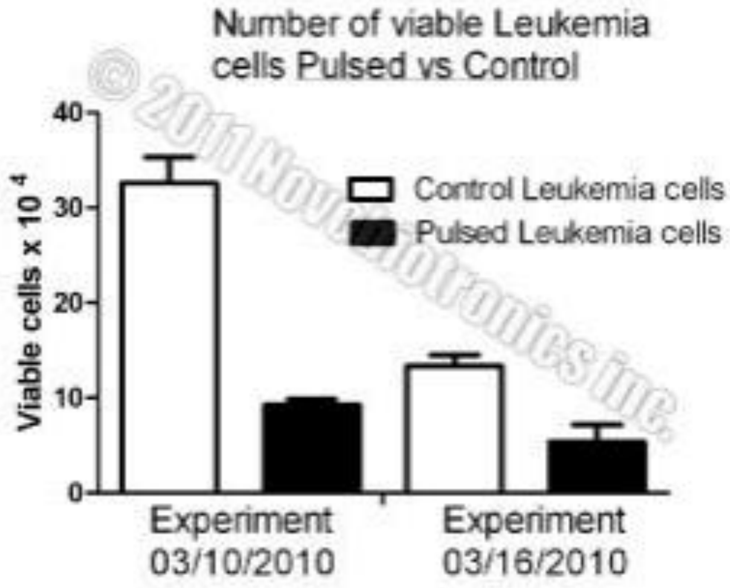


Fig. 2 Selected pathogen bandwidths.

Above: Human leukemia cells breaking up under PEFT.
The same three leukemia cells are shown throughout the montage.
Two cells are undergoing a morphological transformation
and eventual breakup, caused solely by PEFT.





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