

SOBEH has a real and noble ambition, that is to discover and to produce abundantly and for a very long time, hydrocarbons necessary for the sustainable development of Benin. To realize this ambition, it resolutely opted for the use of new and innovative techniques in its activities area of which for example:

1-The integration of the data of seismic survey 4D in the models of reservoir and the Recalage of images based on the not linear elasticity. Indeed, since a few years, the seismic survey 4D realized from several seismic surveys repeated various times, appeared. Several recordings of the seismic data in 3 dimensions are made, the fourth dimension being the time. The 4D consists simply in realizing series of measures in several months apart. By analyzing the variations of the impedances between two times, it is possible to detect the changes occurring in the distribution of the fluids of a reservoir (water, oil, gas) as well as the movements of the fluids in presence. In the practice, the main difficulty is to reposition very exactly in the same place, every series of measure. The seismic survey 4D becomes more democratic progressively in oil companies and tends to become a reliable method of management of reservoirs.

Besides, the integration of these data into the model of reservoir is a major challenge of the modelling of reservoir because these data bring precious information for the geologic characterization of the studied field and for the evaluation of the movement of the present fluids in the reservoir. To date, the classic formulations of the function objective used to integrate the seismic data are not satisfactory, because its do not allow to quantify suitably the difference between two cubes of seismic data.

So, the obtained model will not allow to feign the seismic data collected on the ground. New formulations of the function objective to integrate such data into the models of reservoir turn out essential thus.

As for the recalage of images, it is under constraints if height is based on the density of internal energy of type Ciarlet-Geymonat's material and relaxed if it is based on the density of internal energy of a material of type Saint Venant-Kirchhoff.

2- The restoration of seismic images by optimization of non linear form and application in the sedimentary reconstruction.

The process of restoration consists from an observed image, to identify the phenomena of deformation, then to apply the set of the inverse deformations allowing to return to an image illustrating the initial system of deposits.

3- The analysis and the implementation of new algorithms in spectral methods.

As the spectral method was integrated well in FreeFem3d (specialization of the class SpectralFunction for the manipulation of the spectral functions for example), we can solve a problem of equations in the partial by-products by the spectral and finished methods of elements, by changing only some lines in the program FreeFem3d. This allows to compare the obtained results. We also can solve a problem by a method of elements finished on a part of the global domain, and by the spectral method on the other part of this global domain (with conditions in the adequate limits).

It is advisable to note that FreeFem3d is a free software, written by Stéphane Del Pino. He aims at the resolution of the equations in the elliptic, parabolic partial by-products, and non linear. He is based on the discretisation of basic bricks and piloted by a language close to mathematics. The results of calculations are stored in files under various formats, let us quote for example: .vtu and .bb, which are respectively the readable formats by the software of display Mayavi [58], and speak ill].

Freefem3d is a member of software freefem family (to see for example It allows to generate the meshing of surface of an object built by CSG (Constructive Solid Geometry), by Marching Tetrahedra, it implements besides the method of the fictitious domains, one method of elements finished by degree 2 on several of meshings (tétraédriques, hexaédriques, structured or not).

4-Filtering of seismic multi-component data and estimation of the polarization.

It is a question of establishing new separation methods and characterization of the waves for the processing of multi-component seismic signals in the context of seismic prospecting where we have a set of signals received on sensors' antenna(office) in several components. The new proposed processings take into account the entire available information to improve the performances compared with the existing methods. The efficiency of the proposed algorithms was illustrated on synthetic but also real data, resulting from seismic surveys.

In the concern to resolve at best the current problems, it is advisable to integrate into this type of processings the fourth dimension which is the temporal dimension connected to the repetition of seismic measures at the various moments. Indeed, the seismic measures repeated in the time can help to follow the state of reservoirs of oil or gas in purpose of exploitation. it would be then sensible to add this dimension in processings, by the way, either of a long-vector modelling, or tensorielle to allow then the following of evolution of reservoirs.

The option held by SOBEH is really the implementation of such new techniques in prospecting, exploration and even production of hydrocarbons. All operators contracting in hydrocarbons field in Benin will

thus be deeply invited to the use of the most updated state-of-the-art techniques.

Besides, we should like to underline strongly that Benin abounds in big reservoirs of hydrocarbons contrary to the fashionable public opinion. It is just necessary to identify them most exactly possible. The incredulity being a vector of curse, it is advisable that every Beninese stops believing that our country is " without hydrocarbons resources ".

As for us at SOBEH, we have an unwavering and very reasonable faith that if Nigeria is at present the biggest oil-producing country in Africa, Benin is potentially a very big hydrocarbons producing country: that is to be written.

This prediction will come true undoubtedly sooner or later. But, it is already necessary to invest the necessary energy and enthusiasm. This is why we can logically assert that certainly, the future of SOBEH is radiant! It would seem a dream, but it is a dream which already comes true in faith and hope!