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Extended Abstracts

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The geochronological database of Brazil

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The Geochronological Database of Brazil (GDB) is a computerized system that has been developed to aid the geological community and ordinary users in evaluating both the distribution of the isotopic geochronological analyses and geochronological patterns of an area.

The GDB has been built up from the operational software MS ACCESS, version 2.0, compatible with any IBM-PC superior or equal to 486, with at least 4 megabytes of RAM and 15 megabytes free for the hard disk.

The GDB database structure consists of a main table and 6 queries linked to it.

The main table is divided into specific fields in which each information related to a sample is stored in a specific record. The GDB fields comprise physical and analytical fields. The physical ones consist of order number, isotopic method, field number, sheet (1:1.000.000), lithology, analysed material, geological unit, latitude, longitude, precision of the geographic coordinates (km), geographic reference and bibliographic reference (ref), whilst the analytical fields correspond to data obtained from the isotopic radiogenic systems: Rb (ppm), Sr (ppm), $^{87}\text{Rb}/^{86}\text{Sr}$, Age (My), Ir, MSWD to the Rb/Sr method; %K, %Ar, $^{40}\text{Ar}(\text{rad}) \times 10^{-6}$, Ages (My) to the K/Ar radiogenic system; U (ppm), Pb (ppm), $^{206}\text{Pb}/^{238}\text{U}$, $^{207}\text{Pb}/^{235}\text{U}$, Concordia age (My), Intersept (lower or Upper) to the U/Pb method; Sm (ppm), Nd (ppm), $^{147}\text{Sm}/^{144}\text{Nd}$, $^{143}\text{Nd}/^{144}\text{Nd}$, TDM, Isochron Age (My), $\epsilon\text{Nd}(0)$ to the Sm/Nd method and $^{206}\text{Pb}/^{204}\text{Pb}$, $^{207}\text{Pb}/^{204}\text{Pb}$, $^{208}\text{Pb}/^{204}\text{Pb}$, age (My) and μ_1 to the Pb/Pb methodology. Fields designed from Sg 1 to 9 refer to signal "-" or "+" and Error fields from 1 to 5 are related to age errors.

On the other hand, the query is a group of selected fields created from the main table. There are 6 queries designed to show the physical data from a specific area (figure 1) as well as the analytical and geochronological results of rock samples of an area, from a specific isotopic radiogenic system as illustrated on figures 2, 3, 4, 5 and 6.

The amount of data has been compiled from published papers which have all the information necessary to fill the records of the fields in the main table, and their insertion follow a uniform pattern of writing, for instance *Fm* to design Formation. It is important to mention that, rock samples without the necessary data are kept out of the database.

To operate this database, the user can get the information through two different and exclusive manners. In the first situation, the user locates the datum from the FIND menu of the MS ACCESS, when he specifies the record he is looking for. The second possibility is to create a criterium or criteria from the icon CREATE in the query option. These criteria can be the coordinates of an area for example or still added them to any other record of the fields created previously in the main table in order to specify some region the user is interested in.

Nowadays, the GDB has an available volume of data of the Amazonian Craton, from which the Amazonian Craton Geochronological Map presented at this symposium was built up. In addition, the CPGEO/IGUSP carries on making efforts to expand the GDB to cover the entire Brazil.

Figure 1- Physical data obtained from sheet criterium.

Order	Method	Field no.	Sheet	Litology	Material	Geol Unit	Latitude	Longitude	Prec (km)	Geog. Ref.	Ref
C 1.1	U-Pb	XA-1	SB/SC22	Amphibolite	Zr	Xingu Cpx	-6.033	+49.50	10	SW Marabá	1
C 2.1	U-Pb	GD-1	SB/SC22	Rhyodacite	Zr	Grão Pará Gr	-6.083	+49.96	10	Itacaiunas River	1

Figure 2- Rb-Sr systematics chosen from the main table.

Order	Pb(ppm)	Sr(ppm)	⁸⁷ Rb/ ⁸⁶ Sr	Age (My)	Error	ri
C 22.1	62	12	16.39	2497	+/-62	0.7152
C 33.3	32.4	90.8	1.048	2029	+/-21	0.7025

Figure 3- K-Ar data obtained from sheet, age and method criteria.

Order	Sheet	%K (ppm)	%Ar (ppm)	Ar (rad) x10 ⁻⁶	Ages (My)	Error
C 33.4	SB/SC 22	1.217	24	27.4	495	+/-15
C 39.1	SB/SC 22	6.29	0.5	1223	2409	+/-70

Figure 4- U-Pb data obtained from method and age criteria.

Order	U (ppm)	Pb (ppm)	²⁰⁶ Pb/ ²³⁸ U	²⁰⁷ Pb/ ²³⁵ U	Concordance (My)	Error	Intercept
C 1.1	185	122	0.5534	15.545	2859	+/- 2	Upper
C 2.1	69	45	0.5302	14.031	2759	+/- 2	Upper

Figure 5- Sm-Nd data obtained from sheet and method criteria.

Order	Sm(ppm)	Nd (ppm)	¹⁴⁷ Sm/ ¹⁴⁴ Nd	¹⁴³ Nd/ ¹⁴⁴ Nd	Age(My)	Error	ε _{Nd(t)}
C232	2.7	11.86	0.13776	0.511789	2876	+/-163	+3.2
C242	2.9	12.99	0.1370	0.511483	2876	+/-163	+ 1.8

Figure 6- Pb-Pb data obtained from sheet, age and order criteria.

Order	²⁰⁵ Pb/ ²⁰⁴ Pb	²⁰⁷ Pb/ ²⁰⁴ Pb	²⁰⁵ Pb/ ²⁰⁴ Pb	Age (My)	Error	μ ₁
I 4.2	24.146	16.266	44.492	1632	+/-250	8.163
I 6.2	19.37	15.722	48.688	1632	+/-250	8.163

Amphibolite