

# Atmospheric temperature study on the South pole, since 2018 January to 2019 December.

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**Abstract**— There are diverse and contradictory opinions about of the existence of the global warming. Is not easy to find papers that explain with enough detail, how to measure the atmospheric temperature that support this statement.

In this context, the south pole is a one the most marked geographical areas, as harmed by global warming. Nevertheless, our last research work<sup>1</sup> showed that during the year 2018, the Antartica cooled almost 1°C.

In this situation, and in order to clarify this question, we decided to undertake our own research work. We had used as data source, the value collected by Amundsen-Scott sounding. This base is the most near to the geographic south pole. All its measurements are available in the web site of Wyoming University.

With these data, we calculate the average temperature from the surface level to the mayor high level that arrive the sounding balloon. Each day, each month; since January 1 of 2018 to December 31 of 2019.

The result obtained from our study, cast doubt the existence of the atmospheric warm over the south pole.

**Index Terms**—south pole, atmospheric temperature, global warm.

## I. INTRODUCTION

The atmosphere is an open thermodynamics system, and it behaves like a mixture of ideal gases. For these reasons, it must application of law and principles of the thermodynamics and fluids mechanical when you want to study it.

Under this situation, the atmospheric air interchange heat with all universe, that it is a could calorific focus of the approximately 2.72K(-270,44°C). Of course, any place of the atmosphere is a mayor than the universe, and as there not exist adiabatic zone; all the atmospheric air emit continuously heat to universe; reason why it should cool dawn permanently. This fact unble us to doubt the possible existence of global warm.

For this question, the study was conducted in order to be able to make it clear this situation; choosing us the south pole us an icon and target of the research, since it is one most considered study sites on this subject.

<sup>1</sup> Pérez Raúl C. “Calentamiento Global ¿Mito o Realidad?.” Editorial Académica Española. AV Akademikerverlag GmbH & Co. KG. (ISBN 978-620-0-01476-4). Año 2019.

In order to get this objective, we had used the data sounding of the Amundsen-Scott meteorology station. Its measure value are available on the web site of Wyoming university( <http://weather.uwyo.edu/upperair/sounding.html>)

Temperatures over the atmosphere of the south pole were processed daily, each mount, since January 2018 to December 2019 inclusive.

## II. OBJETIVES

In order to get the expected results, we had worked under the next objectives:

- \_ To can to determinate the trend of the temperature behavior of the atmosphere over south pole.
- \_ Verify the possibility of the global warm existence, or climate change in the south pole.

## III. METODOLOGY

With the sounding temperature data of Amundsen-Scott meteorology station, obtained from the web site of the Wyoming university (<http://weather.uwyo.edu/upperair/sounding.html>), we had studied the next values:

- \_ Temperature measured at surface level.
- \_ The tropopause temperature.
- \_ The vertical average temperature from de surface to 100 milibars level.
- \_ The vertical average temperature from de surface to maximal high that reached the balloon on its rise.

We had processed these data each day of each months, since January 1 of 2018 to December 31 of 2019. In order to obtain expected results, we order the value on the Excel spreadsheets that are showed in the figure 1 and 2.

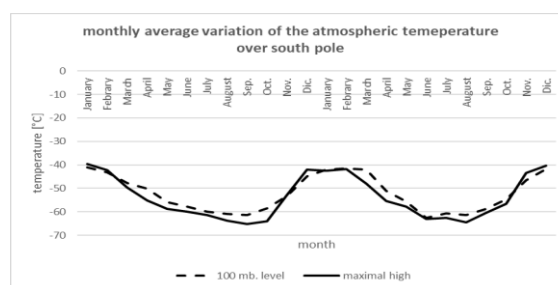


Figure 1. Graphics that show the behavior of the monthly average of the temperature of the atmosphere over south pole.

**Atmospheric temperature structure on the South pole, since 2018 January to 2019 December.**

Into the figure 2, it is showed the Excel spreadsheet with the temperature values at different highs over the south pole to October 2019.

Temperature in °C	1002	1000	998	996	994	992	990	988	986	984	982	980	978	976	974	972	970	968	966	964	962	960	958	956	954	952	950	948	946	944	942	940	938	936	934	932	930	928	926	924	922	920	918	916	914	912	910	908	906	904	902	900	898	896	894	892	890	888	886	884	882	880	878	876	874	872	870	868	866	864	862	860	858	856	854	852	850	848	846	844	842	840	838	836	834	832	830	828	826	824	822	820	818	816	814	812	810	808	806	804	802	800	798	796	794	792	790	788	786	784	782	780	778	776	774	772	770	768	766	764	762	760	758	756	754	752	750	748	746	744	742	740	738	736	734	732	730	728	726	724	722	720	718	716	714	712	710	708	706	704	702	700	698	696	694	692	690	688	686	684	682	680	678	676	674	672	670	668	666	664	662	660	658	656	654	652	650	648	646	644	642	640	638	636	634	632	630	628	626	624	622	620	618	616	614	612	610	608	606	604	602	600	598	596	594	592	590	588	586	584	582	580	578	576	574	572	570	568	566	564	562	560	558	556	554	552	550	548	546	544	542	540	538	536	534	532	530	528	526	524	522	520	518	516	514	512	510	508	506	504	502	500	498	496	494	492	490	488	486	484	482	480	478	476	474	472	470	468	466	464	462	460	458	456	454	452	450	448	446	444	442	440	438	436	434	432	430	428	426	424	422	420	418	416	414	412	410	408	406	404	402	400	398	396	394	392	390	388	386	384	382	380	378	376	374	372	370	368	366	364	362	360	358	356	354	352	350	348	346	344	342	340	338	336	334	332	330	328	326	324	322	320	318	316	314	312	310	308	306	304	302	300	298	296	294	292	290	288	286	284	282	280	278	276	274	272	270	268	266	264	262	260	258	256	254	252	250	248	246	244	242	240	238	236	234	232	230	228	226	224	222	220	218	216	214	212	210	208	206	204	202	200	198	196	194	192	190	188	186	184	182	180	178	176	174	172	170	168	166	164	162	160	158	156	154	152	150	148	146	144	142	140	138	136	134	132	130	128	126	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	64	62	60	58	56	54	52	50	48	46	44	42	40	38	36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	2	0	-2	-4	-6	-8	-10	-12	-14	-16	-18	-20	-22	-24	-26	-28	-30	-32	-34	-36	-38	-40	-42	-44	-46	-48	-50	-52	-54	-56	-58	-60	-62	-64	-66	-68	-70	-72	-74	-76	-78	-80	-82	-84	-86	-88	-90	-92	-94	-96	-98	-100	-102	-104	-106	-108	-110	-112	-114	-116	-118	-120	-122	-124	-126	-128	-130	-132	-134	-136	-138	-140	-142	-144	-146	-148	-150	-152	-154	-156	-158	-160	-162	-164	-166	-168	-170	-172	-174	-176	-178	-180	-182	-184	-186	-188	-190	-192	-194	-196	-198	-200	-202	-204	-206	-208	-210	-212	-214	-216	-218	-220	-222	-224	-226	-228	-230	-232	-234	-236	-238	-240	-242	-244	-246	-248	-250	-252	-254	-256	-258	-260	-262	-264	-266	-268	-270	-272	-274	-276	-278	-280	-282	-284	-286	-288	-290	-292	-294	-296	-298	-300	-302	-304	-306	-308	-310	-312	-314	-316	-318	-320	-322	-324	-326	-328	-330	-332	-334	-336	-338	-340	-342	-344	-346	-348	-350	-352	-354	-356	-358	-360	-362	-364	-366	-368	-370	-372	-374	-376	-378	-380	-382	-384	-386	-388	-390	-392	-394	-396	-398	-400	-402	-404	-406	-408	-410	-412	-414	-416	-418	-420	-422	-424	-426	-428	-430	-432	-434	-436	-438	-440	-442	-444	-446	-448	-450	-452	-454	-456	-458	-460	-462	-464	-466	-468	-470	-472	-474	-476	-478	-480	-482	-484	-486	-488	-490	-492	-494	-496	-498	-500	-502	-504	-506	-508	-510	-512	-514	-516	-518	-520	-522	-524	-526	-528	-530	-532	-534	-536	-538	-540	-542	-544	-546	-548	-550	-552	-554	-556	-558	-560	-562	-564	-566	-568	-570	-572	-574	-576	-578	-580	-582	-584	-586	-588	-590	-592	-594	-596	-598	-600	-602	-604	-606	-608	-610	-612	-614	-616	-618	-620	-622	-624	-626	-628	-630	-632	-634	-636	-638	-640	-642	-644	-646	-648	-650	-652	-654	-656	-658	-660	-662	-664	-666	-668	-670	-672	-674	-676	-678	-680	-682	-684	-686	-688	-690	-692	-694	-696	-698	-700	-702	-704	-706	-708	-710	-712	-714	-716	-718	-720	-722	-724	-726	-728	-730	-732	-734	-736	-738	-740	-742	-744	-746	-748	-750	-752	-754	-756	-758	-760	-762	-764	-766	-768	-770	-772	-774	-776	-778	-780	-782	-784	-786	-788	-790	-792	-794	-796	-798	-800	-802	-804	-806	-808	-810	-812	-814	-816	-818	-820	-822	-824	-826	-828	-830	-832	-834	-836	-838	-840	-842	-844	-846	-848	-850	-852	-854	-856	-858	-860	-862	-864	-866	-868	-870	-872	-874	-876	-878	-880	-882	-884	-886	-888	-890	-892	-894	-896	-898	-900	-902	-904	-906	-908	-910	-912	-914	-916	-918	-920	-922	-924	-926	-928	-930	-932	-934	-936	-938	-940	-942	-944	-946	-948	-950	-952	-954	-956	-958	-960	-962	-964	-966	-968	-970	-972	-974	-976	-978	-980	-982	-984	-986	-988	-990	-992	-994	-996	-998	-1000
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Figure 2. Excel spreadsheet with de temperature data of the Amundsen-Scott sounding over the south pole to October 2019.

**IV. RESULTS**

The results obtained in our analysis, are shown in synthetic form in the next figures:

*The 100 millibars level.*

In the figure 3 it can be seen the behavior of the average temperature of the atmosphere on the south pole, calculate from surface to 100 mb. level, for two years (January 2018 to December 2019).

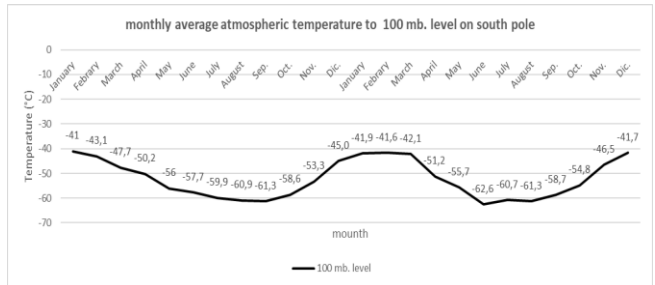


Figure 3. Behavior of the average atmospheric temperature over the south pole, calculate from surface to 100 mb. level.

As you can see in the graph of the figure 3; the important results are:

- 1. The behavior of the average atmospheric temperature over

the south pole present oscillating periods; of course, as it should be, showing warm-up in summer and winter cooling.

- 2. Over two years of study, it can be seen, that the maximal values of high and low atmospheric temperature were approximately the same.

- 3. The previous results and the graph of figure 3 show that, on average, no exist evidence of an atmospheric warm over de south pole, conversely, it seems that the most correct thing is to talk about a steady thermal equilibrium.

*Temperature value on surface*

Other important value to study was the temperature on surface. In the graphic of figure 4, we can to observer the behavior of the atmospheric, compared to the average temperature of the atmospheric air over south pole.

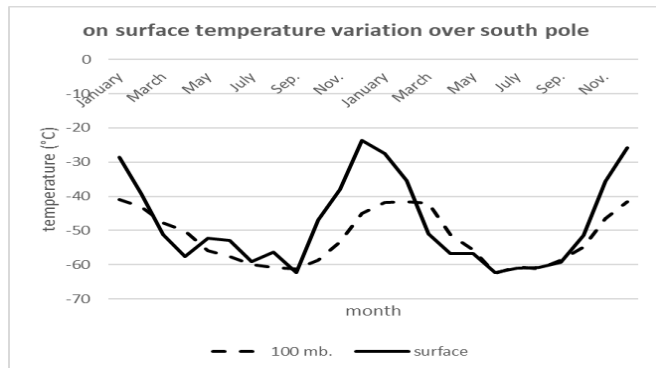


Figure 4. Graphic of the behavior of the surface temperature over the south pole. It is compared with the graphic of the average temperature value of atmospheric air until 100 mb. level

Observing the graphics, interesting questions arise:

- These values present the same oscillation period, with summer warm and cooling winter.
- The warm amplitude on surface present values much greater than the average temperature until 100 mb. level, but the cooling values amplitude are approximately equal.

*The tropopause temperature*

Also, it is interesting of study the tropopause temperature on the south pole. Its behavior is showed in the graphic of the figure 5.

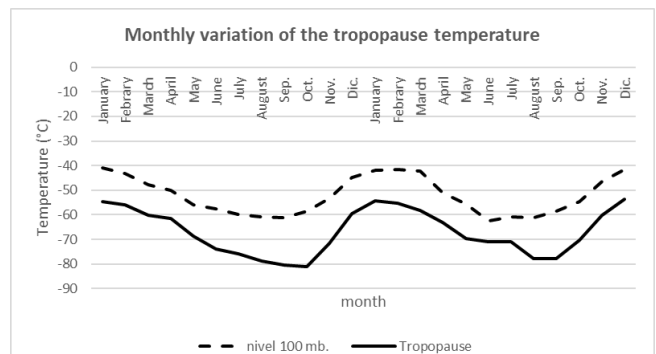


Figure 5. Figure 4. Graphic of the behavior of the tropopause temperature over the south pole. It is compared with the graphic of the average temperature value of atmospheric air until 100 mb. level

As in all previous cases, we can observe also an oscillate behavior of the south pole tropopause temperature, with higher temperature in the summer and major cooling in winter. The temperature value spread between the tropopause and the average value until 100 mb. is big, being the coldest troposphere.

#### IV. CONCLUSIONS

The table 1 shows the result of the calculation of all monthly average temperature value in our study, since January 2018 to December 2019.

Year	2018 Temperature (°C)											
month	January	February	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dic.
100 mb.	-41	-43,1	-47,7	-50,2	-56	-57,7	-59,9	-60,9	-61,3	-58,6	-53,3	-45,0
h max.	-39,7	-42,3	-49,7	-55,2	-58,8	-60	-61,4	-63,8	-65,2	-64,0	-52,8	-42,0
surface	-28,5	-39,3	-51,2	-57,5	-52,3	-52,9	-59,2	-56,4	-62,4	-46,9	-37,9	-23,7
Tropopause	-54,7	-55,9	-60,1	-61,5	-68,7	-73,8	-75,8	-78,8	-80,5	-81,2	-71,8	-59,6
Year	2019 Temperature (°C)											
month	January	February	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dic.
	-41,9	-41,6	-42,1	-51,2	-55,7	-62,6	-60,7	-61,3	-58,7	-54,8	-46,5	-41,7
	-42,4	-41,8	-47,9	-55,5	-57,8	-63,0	-62,5	-64,4	-60,4	-56,5	-43,5	-40,3
	-27,5	-35,5	-50,9	-56,8	-56,8	-62,3	-61,1	-60,8	-59,3	-51,5	-35,7	-25,7
	-54,3	-55,3	-58,3	-63,0	-69,8	-71,0	-71,0	-77,7	-77,7	-70,3	-60,3	-53,8

Table 1. average temperature values over south pole during period January 2018 to December 2019.

So, it can be seen that:

1. The average atmospheric temperature over the south pole from surface to 100 millibars level, cooled 4°C the first year and 0,7°C during the two years of study.
2. The average temperature of the atmosphere calculate since surface of south pole to maximal high arrived at the sounding balloon, present a cooled of the 2,3°C during a first year, and 0,6°C throughout to years analyzed.
3. Also, it can be observed that the monthly average temperature of the surface warm a one Celsius degree on the first year, and 2,8°C during the two years.
4. When the tropopause temperature is observed, it can be appreciated that, the first year it had cooled 4,9°C, and during all two years it was warm 0,9°C.

Es important distinguish that the tropopause and on surface temperature values do not are a global parameter, only represent the data of a single level of the atmospheric temperature; conversely, the average temperature values from on surface to 100 mb. level or maximal high are the global parameters. So, the temperature global parameters show a global cooling; whereas that the singles level present a warm process.

This situation indicate that, we have to be careful when stating that about the existence or not of the global warm; the form of how and where the temperature data is taken becomes main.

These results obtained do not even presume existence of a warming over the south pole.

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3. Re-engineering of the Artificial Modification of Atmospheric Processes in Mendoza. 2006.
4. Theoretical Modeling and Research of Atmospheric Geophysics of Climate Change for Operational Mitigation Implementations. 2009.
5. Reengineering Project of Climate Studies to Increase Precipitation by Implementation of Artificial Techniques 2008.
6. Didactic and methodological strategies to transfer environmental knowledge in the training of the Civil Engineer of five UTN Faculties 2013.
7. Research and Modeling of Climate Atmospheric Processes for its Operational Treatments (IMPACTO)". 2014
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#### PUBLISHED BOOKS:

1. "Dinámica Atmosférica y los Procesos Tormentosos Severos". Academic Publishing GmbH& ISBN: 978-3-8454-9359-6. 2011.
2. "Fisicologosofando". Academic Publishing GmbH& Co. ISBN 978-3-8454-9845-4. 2011.
3. "La Mecánica de Fluidos abordada desde el formalismo de la Mecánica Cuántica". Academic Publishing GmbH& Co. KG.2011. ISBN: 978-3-8465-7115-6. ISBN-10: 3846571156. EAN: 9783846571156. 2011.
4. "Física de los fenómenos atmosféricos y meteorológicos". AV Akademikerverlag GmbH & Co. KG. ISBN: 978-3-659-06704-4. 2013.
5. "Teoría del Big Bang, Evolucionismo y una cosmovisión científica"". AV Akademikerverlag GmbH & Co. KG. ISBN: 978-3-07489-9. 2013.
6. "Teoría de la Relatividad, relativismo y verdad"". AV Akademikerverlag GmbH & Co. KG. ISBN: 978-3-639-78433-6. 2016.
7. "Modelo Estable de Tropósfera para Estudio Operaciones y Simulaciones (METEOS)". AV Akademikerverlag GmbH & Co. KG. ISBN: 978-3-639-84263-0. 2016.
8. "PRECIPITA, Un Proyecto de Incremento de Precipitaciones". AV Akademikerverlag GmbH & Co. KG. ISBN: 978-3-330-09251-8. 2017.

9. "La Investigación en la Educación: Esencia de las Ciencias". Editorial Académica Española. AV Akademikerverlag GmbH & Co. KG. Junio de 2018. ISBN: 978-620-2-14637-1. 2018.

101. "Calentamiento Global ¿Mito o Realidad?". Editorial Académica Española. AV Akademikerverlag GmbH & Co. KG. (ISBN 978-620-0-01476-4). 2019.

Malargüe, Mendoza, November 2011

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- Degree in Math..

### 1. Academic works

Director, Don Bosco Vocational Training Institute.

Direction of students for the development of final works.

Professor careers:

- Systems Analyst and Programmer, Software Development.
- High School Teachers in Mathematics
- Senior Winemaker and Senior Technician in Fruit and Vegetable Industries

### 2. Research works

Researcher of the Center for Sustainable Development Studies (CEDS). Department of Civil Engineering. U.T.N., F.R.M. Since 2006.

Research project: "Theoretical analysis and operational modeling on atmospheric risk events and phenomena (ATMOSFERA)". Approved UTI4814TC, Provision N°423 / 2017. LIHANDO, Department of Civil Engineering, U.T.N., F.R.M. Since 2017.

Research project: "Research and Modeling of Atmospheric Climate Processes for its Operational Treatments (IMPACT)". Approved code 22\_16TC. LIHANDO, Department of Civil Engineering, U.T.N., F.R.M. Since 2014.

Research project: "Blockchain Technology: application to educational management", D.G.E. Mendoza, Instituto Superior San Vicente de Paul. Since March 2019.

Research project: "Re-engineering of the Climate Stimulation of the Increase in Precipitation by Artificial Techniques (PRECIPITA)", Approved code J050, MINCYT N° 2624/08. LIHANDO, Department of Civil Engineering, U.T.N., F.R.M. December 2008 to March 2017.

Research project: "Re-engineering of the Artificial Atmospheric Modification in Mendoza", CEDS, U.T.N., F.R.M. August 2006 to December 2008

### 3. Publications works

PRECIPITA: An experience of modification on the precipitation process in order to develop sustainable aquifers in Mendoza (Argentina)

Modern Environmental Science and Engineering - ISSN 2333-2581 - 2019  
Proceedings summaries 13th International E-ICES Meeting 13, meeting of the International Center for Earth Sciences.

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Influence of the size of the particles emitted to the atmosphere on climatic environmental impacts

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Study of the amount of particles emitted to atmospheric air to produce climatic impacts

Malargüe, Mendoza, November 2013

Proceedings summaries 7th International Meeting E-ICES 7, meeting of the International Center for Earth Sciences.

Re-engineering project for the climatic stimulation of the increase in rainfall by artificial techniques PRECIPITA