UNIVERSIDADE TECNOLÓGICA FEDERAL DO PARANÁ
DEPARTAMENTO ACADÊMICO DE ELÉTRICA
CURSO DE ENGENHARIA ELÉTRICA

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MODELO DE TRABALHO DE CONCLUSÃO DE CURSO DE ENGENHARIA ELÉTRICA UTFPR-PB

TRABALHO DE CONCLUSÃO DE CURSO

PATO BRANCO

2020

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Trabalho de Conclusão de Curso de graduação, apresentado à disciplina de Trabalho de Conclusão de Curso 2, do Curso de Engenharia Elétrica da Coordenação de Engenharia Elétrica - COELT - da Universidade Tecnológica Federal do Paraná - UTFPR, Câmpus Pato Branco, como requisito parcial para obtenção do título de Engenheiro Eletricista.

Orientador: Profa

Coorientador: Profb

PATO BRANCO

2020

TERMO DE APROVAÇÃO

O Trabalho de Conclusão de Curso intitulado **MODELO DE TRABALHO DE CONCLUSÃO DE CURSO DE ENGENHARIA ELÉTRICA UTFPR-PB** dos acadêmicos **autora** e **autorb** foi considerado **APROVADO** de acordo com a ata da banca examinadora **N° 000** de **2020**.

Fizeram parte da banca examinadora os professores:

Profa

Profb

Prof1

Prof2

Dedicatória

Acreditar é mais fácil do que pensar. Daí existem muito mais crentes do que pensadores.

Bruce Calvert

AGRADECIMENTOS

Agradecimentos

RESUMO

Resumo

Palavras-chave: Geração intermitente, Mercado de energia elétrica, Energia Renovável.

ABSTRACT

Abstract

Keywords: Intermitent Generation, Electricity Market, Renewable Energy.

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LISTA DE ABREVIATURAS E SIGLAS

DMA	.
EASREFER	Teste da lista de siglas 2. Esta possui um significado bem grande que ocupa mais de uma linha.
ER	Teste da lista de siglas 3.
SQPNA	Sigla em Que os Parênteses Não Aparecem .
TDLS1	Teste da lista de siglas 1.

LISTA DE SÍMBOLOS

ϕ	Phi
$\vec{\alpha}$	Alpha
$\upsilon\omega\psi_{n-1}^{jk}$	Função de teste da lista de símbolos. Está é uma descrição longa para um único símbolo
∇	Gradiente
$\upsilon\omega\psi_{n-1}^{jk}$	teste

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4 CASSINI FINDS HYDROCARBON RAINS MAY FILL TITAN LAKES

CASSINI IMAGING CENTRAL LABORATORY FOR OPERATIONS Posted: January 29, 2009

Recent images of Titan from NASA's Cassini spacecraft affirm the presence of lakes of liquid hydrocarbons by capturing changes in the lakes brought on by rainfall. For several years, Cassini scientists have suspected that dark areas near the north and south poles of Saturn's largest satellite might be liquid-filled lakes. An analysis published today in the journal Geophysical Research Letters of recent pictures of Titan's south polar region reveals new lake features not seen in images of the same region taken a year earlier. The presence of extensive cloud systems covering the area in the intervening year suggests that the new lakes could be the result of a large rainstorm and that some lakes may thus owe their presence, size and distribution across Titan's surface to the moon's weather and changing seasons. A Figura 1

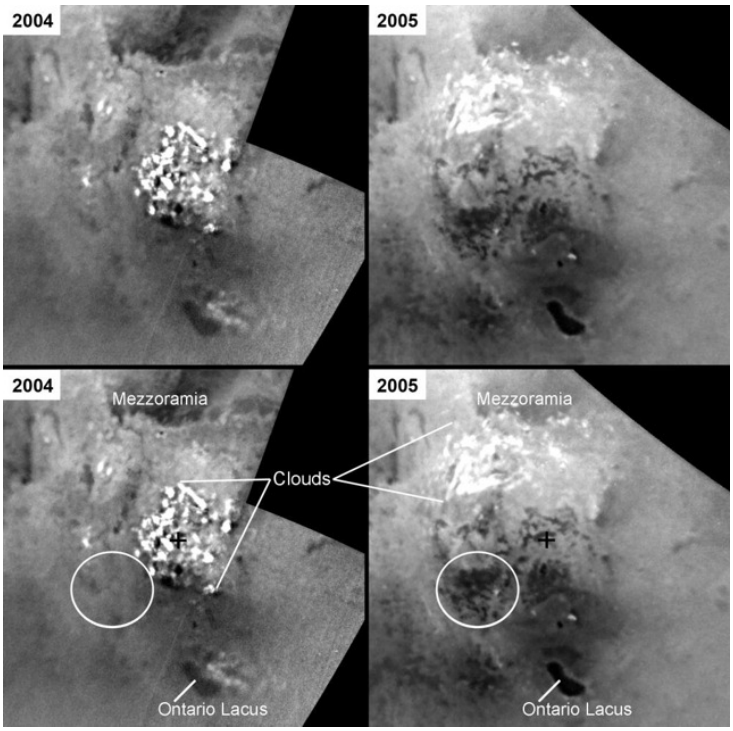

Figura 1: These mosaics of the south pole of Saturn's moon Titan, made from images taken almost one year apart, show changes in dark areas that may be lakes filled by seasonal rains of liquid hydrocarbons. Credit: NASA/JPL/Space Science Institute.
Fonte: NASA/JPL/Space Science Institute

The high-resolution cameras of Cassini's Imaging Science Subsystem have now surveyed nearly all of Titan's surface at a global scale. An updated Titan map, being released today by the Cassini Imaging Team, includes the first near-infrared images of the leading hemisphere portion of Titan's northern "lake district"captured on Aug. 15-16, 2008. (The leading hemisphere of a moon is that which always points in the direction of motion as the moon orbits the planet.) These ISS images complement existing high-resolution data from Cassini's Visible and Infrared Mapping Spectrometer (VIMS) and RADAR instruments[1].

Such observations have documented greater stores of liquid methane in the northern hemisphere than in the southern hemisphere. And, as the northern hemisphere moves toward summer, Cassini scientists predict large convective cloud systems will form there and precipitation greater than that inferred in the south could further fill the northern lakes with hydrocarbons.

Some of the north polar lakes are large. If full, Kraken Mare – at 400,000 square kilometers – would be almost five times the size of North America's Lake Superior. All the north polar dark "lake" areas observed by ISS total more than 510,000 square kilometers – almost 40 percent larger than Earth's largest "lake", the Caspian Sea.

However, evaporation from these large surface reservoirs is not great enough to replenish the methane lost from the atmosphere by rainfall and by the formation and eventual deposition on the surface of methane-derived haze particles.

"A recent study suggested that there's not enough liquid methane on Titan's surface to resupply the atmosphere over long geologic timescales", said Dr. Elizabeth Turtle, Cassini imaging team associate at the Johns Hopkins University Applied Physics Lab in Laurel, Md., and lead author of today's publication. "Our new map provides more coverage of Titan's poles, but even if all of the features we see there were filled with liquid methane, there's still not enough to sustain the atmosphere for more than 10 million years".

Combined with previous analyses, the new observations suggest that underground methane reservoirs must exist.

Titan is the only satellite in the solar system with a thick atmosphere in which a complex organic chemistry occurs. "It's unique", Turtle said. "How long Titan's atmosphere has existed or can continue to exist is still an open question".

[1] **Nota de rodapé. Teste**

That question and others related to the moon's meteorology and its seasonal cycles may be better explained by the distribution of liquids on the surface. Scientists also are investigating why liquids collect at the poles rather than low latitudes, where dunes are common instead.

"Titan's tropics may be fairly dry because they only experience brief episodes of rainfall in the spring and fall as peak sunlight shifts between the hemispheres", said Dr. Tony DelGenio of NASA's Goddard Institute for Space Studies in New York, a co-author and a member of the Cassini imaging team. "It will be interesting to find out whether or not clouds and temporary lakes form near the equator in the next few years".

Titan and the transformations on its surface brought about by the changing seasons will continue to be a major target of investigation throughout Cassini's Equinox mission.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency (ESA) and the Italian Space Agency. The Jet Propulsion Laboratory (JPL), a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging team consists of scientists from the U.S., England, France, and Germany. The imaging operations center and team leader (Dr. C. Porco) are based at the Space Science Institute in Boulder, Colo. The Applied Physics Laboratory, a division of Johns Hopkins University, meets critical national challenges through the innovative application of science and technology.

4.1 SEÇÃO DE TESTES

Exemplo de citação longa:

> The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency (ESA) and the Italian Space Agency. The Jet Propulsion Laboratory (JPL), a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington.

E agora um exemplo de quadro, que é igual tabela.

Tabela 1: Exemplo de Tabela

Posição	Município	População
1	São Paulo	11.376.685
2	Rio de Janeiro	6.690.290
3	Salvador	2.710.968
4	Brasília	2.648.532
5	Fortaleza	2.500.194

Fonte: (BRIGNOL, 2010)

Quadro 1: Exemplo de Quadro

Município	Letra
São Paulo	a
Rio de Janeiro	b
Salvador	c
Brasília	d
Fortaleza	e

Fonte: (BRIGNOL, 2010)

4.1.1 TESTES E EXEMPLOS DE LISTA DE SIGLAS

Testes da lista de siglas:

(TDLS1).

(EASREFER).

(ER).

Esta é uma sigla em que os parênteses não aparecem: SQPNA.

(DMA).

É preciso rodar duas vezes o Latex para que a lista de siglas seja atualizada.

4.1.2 TESTES E EXEMPLOS DE LISTA DE SÍMBOLOS

$$\phi = \vec{\alpha} \otimes \upsilon\omega\psi_{n-1}^{jk} \tag{1}$$

Onde:

ϕ: Angulo phi.

$\vec{\alpha}$: Alfa.

$\upsilon\omega\psi_{n-1}^{jk}$: Um simbolo grande.

Este símbolo (∇) foi inserido no texto, fora do ambiente *equation*.

$\upsilon\omega\psi_{n-1}^{jk}$

4.1.3 EXEMPLOS DE CITAÇÃO DE REFERÊNCIAS BIBLIOGRÁFICAS

(GRAINGER; STEVENSON, 1994)

(ANDERSON; FOUAD, 1977; GLOVER; SARMA, 2002)

Conforme Frasson (2003) a metodologia proposta é, bla bla bla...

(BRIGNOL, 2010)

5 NÍVEL 1 - TESTES DE CAPITULAÇÃO - PRIMÁRIO

5.1 NÍVEL 2 - SECUNDÁRIO

5.1.1 NÍVEL 3 - TERCIÁRIO

5.1.1.1 NÍVEL 4 - QUATERNÁRIO

5.1.1.1.1 NÍVEL 5 - QUINÁRIO

5.1.1.1.1.1 NÍVEL 6 - ???

6 CONCLUSÕES

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