

Feature

- Remote sensing monitoring: it can be detected 1Km away from the target without needing to be close to the target;
- No sampling required: complete remote sensing monitoring technology;
- Rapid detection: 0.03s measurement time;
- Continuous measurement: 30Hz monitoring speed;
- Emission estimation;
- Accurate ranging: Built-in laser ranging, the maximum distance is 2Km;
- Built-in GPS positioning;
- Accurate quantification: not disturbed by clouds;
- Simple operation: only simple training can be precise operation;
- On-site testing: all the instruments, reagents and other accessories required for testing are packed in a test box with a 20-inch suitcase.

Application

- Industrial chimney discharge;
- CEMS



GF320HH handheld camera



GF320OL on-line monitor

Description

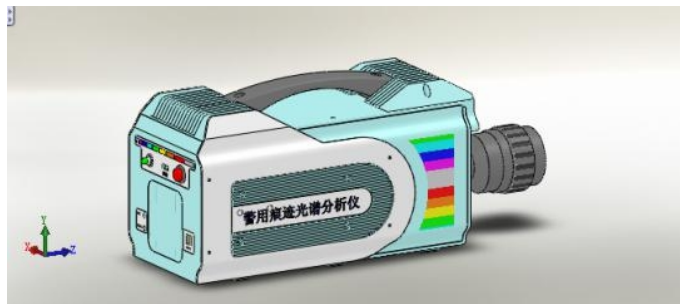
Methane is common in the extraction of oil, coal and natural gas resources and chemical industry production, is the main components of natural gas and it could not effectively to gas leak monitoring and reported to the police, in the process of gas production, LNG transportation and storage variation in leak explosion hazard, so several incidents happened in recent years, Causing casualties and property losses; In the petroleum, coal mining, chemical production, biogas application and other fields, safety accidents caused by gas leakage also occur from time to time, which seriously threatens the safety of human life and property.

In order to avoid and reduce the loss caused by gas leak to the greatest extent, it is increasingly important to develop real-time detection and leakage monitoring technology of methane gas.

GF320 is a OGI thermal imaging camera of displaying and CH₄ and VOCs leaks without stopping operations. The portable thermal imager is able to detect leaks from a safe distance, providing operator safety, and it can track gases that are hazardous to the environment for environmental protection benefits. GF320 is suitable for industrial applications such as refineries, gas treatment plants, offshore oil and gas platforms, chemical/chemical industries, biogas plants and power plants.

GF320 also built-in GPS, laser ranging and other functions, very practical.

Model	Feature
GF320-CH ₄	Monitor CH ₄ leak
GF320-VOCs	Monitor VOCs leak



GF320PT portable chimney emission monitor



1. Principle

Methane is commonly used in the exploitation of petroleum, coal and natural gas resources and in chemical production. It is an important fuel and chemical raw material, as well as a major component of natural gas. In recent years, the proportion of natural gas exploitation and use in China is increasing day by day. At present, liquefaction technology can be used to transport and store liquefied natural gas (LNG) well, which facilitates people's life and promotes economic growth. Due to the inability to effectively

monitor and alarm gas leakage, it is easy to produce leakage and explosion potential in the process of gas mining, LNG transportation and storage. Therefore, several accidents have occurred in recent years, causing casualties and property losses. In the fields of petroleum, coal mining, chemical production and biogas application, safety accidents caused by gas leakage also occur from time to time, which seriously threatens the safety of personnel's lives and property.

In order to avoid and reduce the loss caused by gas leakage to the greatest extent, it is increasingly important to develop real-time detection and leakage monitoring technology of methane gas. Infrared imaging method includes infrared spectral imaging method and infrared thermal imaging method. Among them, the reaction speed of infrared spectral imaging is slow, the structure is complex, and the key components have not broken through the technical blockade in China. And infrared thermal imaging method through the infrared optical system, infrared filter and infrared focal plane detector measured gases direct detection of specific absorption peak wavelength of the infrared thermal radiation characteristic signal, through the photoelectric conversion and converts gas leak to the human eye visible image processing image, to be able to dynamically and visually determine leakage position, and can realize gas leakage alarm.



Figure 1 CH₄ is the main component of gas and natural gas, and it is easy to cause explosion when it leaks

2. Monitor renderings

According to the theory of gas molecular spectrum, methane gas has four characteristic absorption peaks in the wavelengths near the positions of 1.6 μm , 2.3 μm , 3.31 μm and 7.67 μm . The absorption peaks at 1.6

μm and $2.3 \mu\text{m}$ in the near infrared band are weak, the absorption peaks at $3.31 \mu\text{m}$ in the middle infrared band and $7.67 \mu\text{m}$ in the far infrared band are strong, which can be used for methane gas detection.

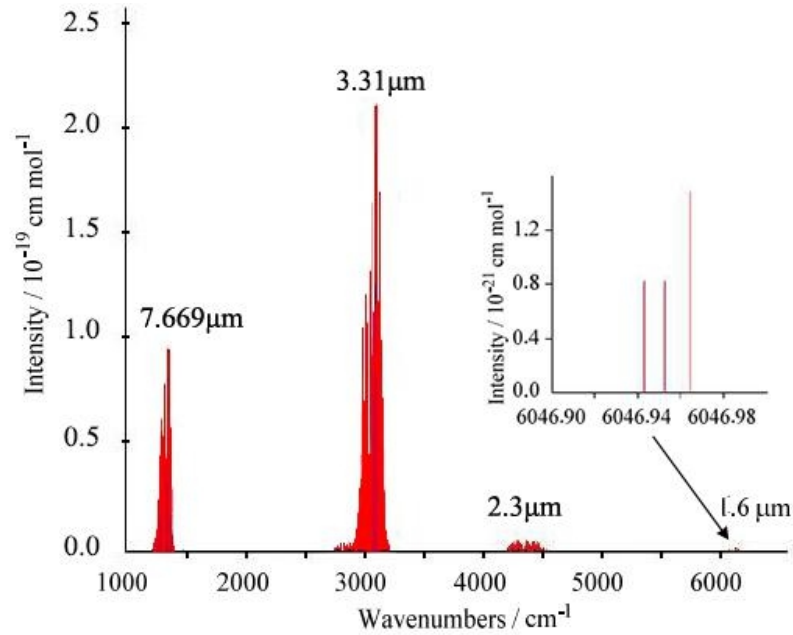


Figure 2 Characteristic absorption spectra of methane under normal conditions

2. Monitor Renderings



Figure 3 Monitor methane emissions from gas tanks

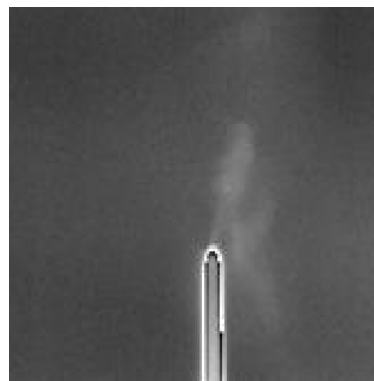


Figure 4 Monitor the methane gas coming out of the nozzle

3. Environmental Monitoring Products



Water quality and environmental protection product line





UAV inspection system:

- Multi-parameter water quality: COD, total phosphorus, total nitrogen, chlorophyll, blue-green algae, red tide
- Marine oil spill patrol system



Ship-based inspection system:

- Multi-parameter water quality: blue-green algae, red tide; marine oil spill inspection
- In research: Dissolved oxygen, nitrite, ammonia nitrogen, pH, salinity, COD, total phosphorus, total nitrogen, chlorophyll



Shore-based real-time monitoring system:

- Multi-parameter water quality: blue-green algae, red tide
- In research: COD, total phosphorus, total nitrogen, chlorophyll



Underwater inspection system:

- Multi-parameter water quality: dissolved oxygen, nitrite, ammonia nitrogen, pH, salinity, COD, total phosphorus, total nitrogen, chlorophyll, blue-green algae, red tide
- Marine microplastics

Figure 5 Water quality monitoring products produced by Optosky (as of December 2020)

			
ATW6000 Dissolved oxygen monitoring sensor	ATW6500 Fishing ground 5 parameter monitoring system (Dissolved oxygen, temperature, conductivity, PH value and turbidity))	ATP9100W Portable water quality remote sensing monitoring system (Red tide, blue-green algae)	ATW3000 Column type hyperspectral water quality remote sensing monitoring system (Red tide, blue-green algae; plankton)
			
ATW2000 Underwater UV-Vis Spectrophotometer (Absorbance Analyzer)	ATW2300 Underwater chlorophyll fluorescence detector	ATW2310 Underwater fluorescence spectrum analyzer	ATW2320 Water environment hyperspectral analyzer /Hyperspectral radiometer
			ATR2000W Underwater Raman Spectrometer

Figure 6 Water quality monitoring products produced by Optosky (as of December 2020)



ATH9012W
UAV-borne water
quality remote sensing
monitoring system



ATE2000
Reagent-free multi-
parameter water quality
analyzer



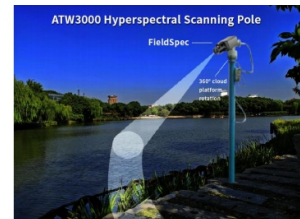
ATE3000
Portable multi-parameter water
quality analyzer

Figure 7 ATH9012W UAV hyperspectral water quality remote sensing monitoring system, ATE2000 reagent free multi-parameter water quality detector, ATE3000 portable multi-parameter water quality analyzer (as of December 2020)



ATE5000YW
Airborne Fluorescence Imaging Oil Pollution Remote
Sensing System

Work Day & Night

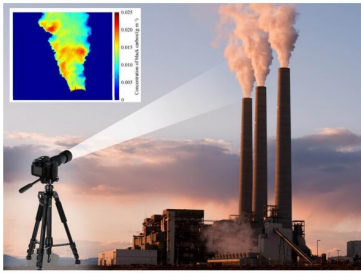


ATF2500ONL
Online Oil Pollution Monitor
River cross-section



ATF2500
Handheld Fluorescence
Oil Pollution Monitor

Figure 8 ATE5000YW UAV surface oil pollution remote sensing monitoring system, ATF2500ONL online river section oil pollution monitoring device, ATF2500 portable surface oil pollution monitoring device



GF300
Chimney emission remote measurement system (SO₂, NO₂, carbon black)



GF300HH

GF300OL

GF300PT



GF320
Methane and VOCs leak detection system



GF320OL

GF320PT

Figure 9 GF300 chimney gas emission remote sensing monitoring system, GF320 methane and VOCs leakage detection system produced by Optosky

4. Company Profile

Optosky company is an first-class spectroscopy solution provider, with the headquarter locates in the 7th floor of the research institute of the Chinese Academic of Science at an area of 2500 square meter in Xiamen city where successfully held the international 9th BRICK summit in 2017. The subsidiary company locates in Wuhu city with an area of 2035 square meter.

The company founder Dr.Hongfei,Liu graduated Docter degree from Chinese Academic of Science and postdoctoral degree from Xiamen University, by integrating both of top Universities' spectroscopy technology background into Optosky company aiming at developing the leading spectroscopy equipment in the world.

The company bases on unique technologies of Optomechatronics, Spectroscopy Analysis, Process Weak Optical and Electrical Signals, Cloud Computing, and have been developed wide products line of the competitive Raman spectroscopy instruments, micro spectrometer, hyperspectral imager, field spectroradiometer, fluorescence spectroscopy, LIBS etc. Driven by advanced technologies and products, Optosky brand has been well-known to customers all over the world.

Optosky company base on technologies innovation, market driven direction, customer first,

provides first-class products and services, and one-stop solutions to many fortune 500 companies in many industries. The company received praise from different industries companies, as well as many innovative intellectual property, software copyright, qualification certification, and winner awards over hundred numbers.

Optosky receives top class A introduced high-tech company to international Xiamen city, the national high-tech and new innovative technology company award. The founder Dr.Hongfei Liu receives the innovation talent award by ministry of science and technology.

The company is currently conducting the exclusive project of major industrialization national oceanic administration with a total fund of five million us dollar. The company in charge of drafting national industry standard of VNIR and SWNIR Field Spectroradiometer, and six national standard drafter, including China National Standard Drafter for Hazmat detector based on Raman spectroscopy, China National Standard Drafter for Buoy-type Monitor eco-environment, China National Standard Drafter for water quality monitor in unmanned boat, China National Standards drafter for online water quality monitor by spectroscopy, China National Standard Drafter for UV-absorbent measure fabrics.

The company has over 70 IPs and over 20 innovative patents.

The company received ISO9001:2015 certification, CE certification, Police Administration Certification, FDA approval compliant, IQOQPQ compliant.



Figure 10 Optosky (Xiamen) Photonics Inc. Company Headquarter

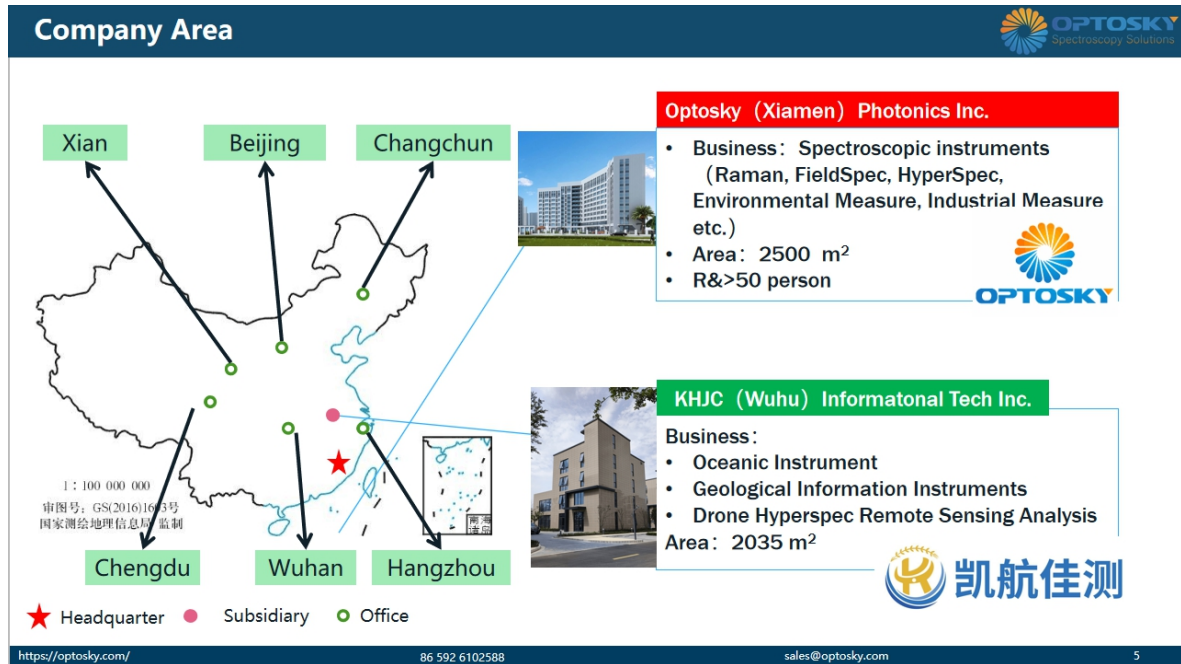


Figure 11 Optosky Company Area

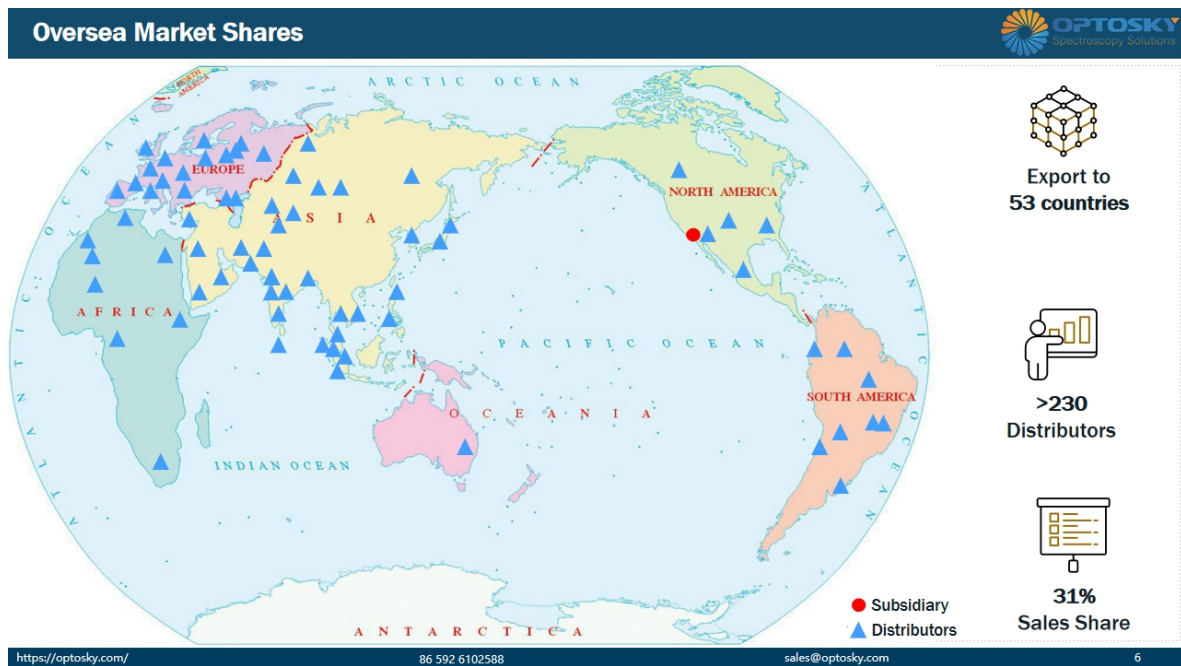


Figure 12 Oversea Market Shares

Optosky Chair and Draft National Standards Lists:

Chair Drafter

National Industry Standard Of VNIR & SWNIR Field Spectroradiometer

China National Standard Drafter for Buoy-type Monitor eco-environment

China National Standard Drafter for water quality monitor in unmanned boat

China National Standard Drafter for Raman spectrometer

China National Standard Drafter for Hazmat detector based on Raman spectroscopy

China National Standards drafter for online water quality monitor by spectroscopy

China National Standard Drafter for UV-absorbent measure fabrics

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Figure 13 Optosky Chair and Draft National Standards Lists.

Qualification

ISO9001:2005	GB/T 23001 Informationization & Innovation	CE, RoHS, LVD 17 models	Police Approval 11 models
GB/T 29490 IP implementation	5 Innovative patents	35 patents new utility design	32 Software copyright

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Figure 14 Qualification

Informationization & Industrilization Fusion Management System

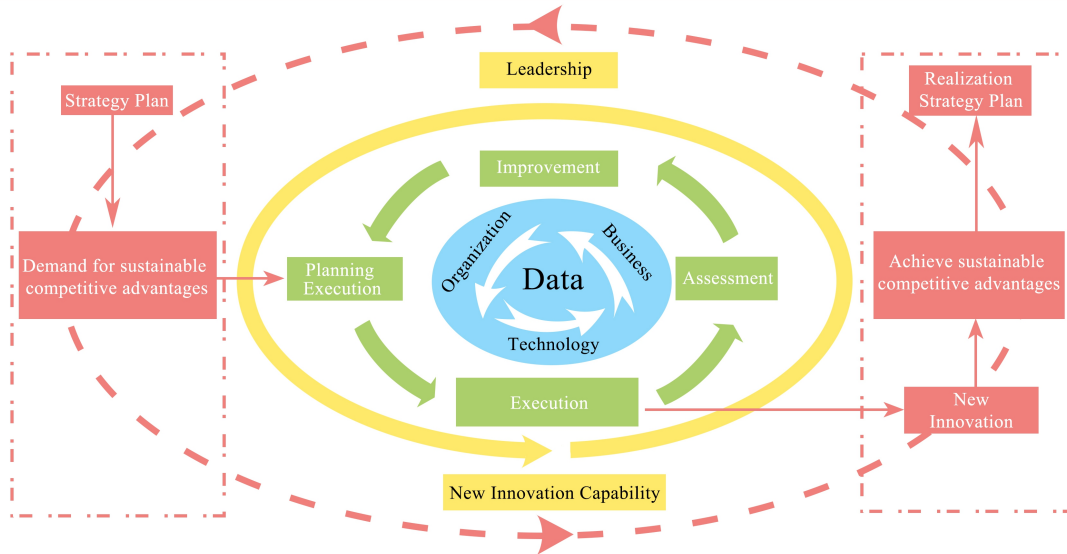


Figure 15 GB/T 23001_ Informationization & Industrilization Fusion Management System

Co-Founder—Dr. Hongfei Liu



Postdoctoral Hongfei Liu

- Selected "Innovative Talent" by Science and Technology ministry
- Top Class A Talent by Xiamen City
- CCTV Science & Technology Interview
- Fortune 500 experience in Agilent, II-VI

- Honors**
 - Selected by science & technology ministry as "Innovation Talent"
 - CCTV Science & Technology Interview
 - Top Class A Talent credited by Xiamen City
 - Innovation Hero**
- Education**
 - PhD • Chinese Science of Academic • Prof. Gui-Lin Chen, Originator in spectroscopy
 - Postdoctoral • Xiamen University • Prof. Zhong-Qun Tian guided by the SERS founder M.Fleischmann
- Career**
 - Engineer → R&D Manager → GM
 - Agilent**, Leader of instrument, Fortune 500 company, Job: engineer
 - II- VI Incorporated (Nasdaq: IIVI) leader in optical & electrical industries, Job: GM of Instrumentation and Automation
- Academic**
 - University graduate tutor
 - obtain more than 60 IPs, more than 10 Innovation patents;
 - Publish more than 20 papers, 2 recorded SCI, 8 recorded EI



Selected "Innovative Talent" by Science and Technology ministry



Top Class A Talent by Xiamen City



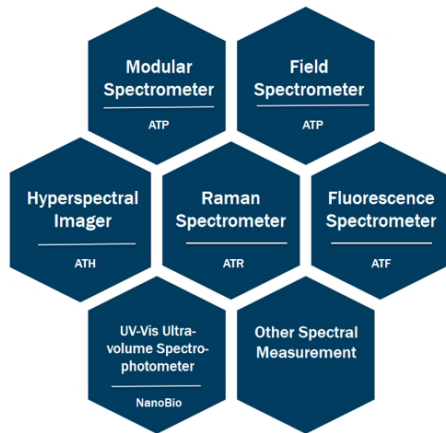
Founder & Tutors

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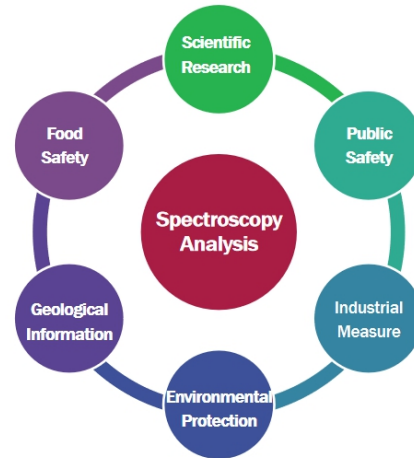
Figure 16 Optosky's Co-founder_Dr. Hongfei Liu

Category & Application

Category



Application



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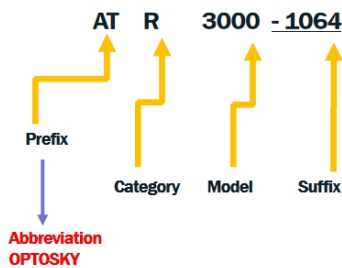
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Figure 17 Category & Application

Model Name Rule

Model Name Rule:

- Prefix
- Category
- Model
- Suffix



- **ATR** - Raman Spectrometer
- **ATP** - Micro Spectrometer
- **ATH** - Hyperspectral Imager
- **ATF** - Micro Fluorescence Spectrometer
- **ATL** - LIBS
- **ATW** - Water
- **ATE** - Environment Protect
- **ATFD** - Food Safety
- **GA** - Public Safety (**Gong An**)
- **GF** - Gas Monitor (**Gas Finder**)
- **GY** - Industrial Monitor (**Gong Ye**)

eg:

- Raman Microscope: ATR8300MP-1064
- Hyperspectral Imager: ATH9500

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Figure 18 Model Name Rule

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End
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