

**The Xie Jialin Prize for outstanding work in the accelerator field, with no age limit.**

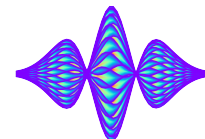


**Prof. Vittorio Giorgio VACCARO**

*‘For his pioneering studies on instabilities in particle beam physics, the introduction of the impedance concept in storage rings and, in the course of his academic career, for disseminating knowledge in accelerator physics throughout many generations of young scientists.’*

**Just few words on him, as he could not join us...**

E. Métral



- ◆ Born in Naples (Italy) in 1941
- ◆ Electronic Engineer from University of Naples
- ◆ Hired by CERN as Electronic Engineer in 1966
- ◆ “The fluke of my life was to meet at CERN Andy Sessler who was on leave of absence from Berkeley”
- ◆ Went back to Naples in 1969, appointed as professor of Electromagnetic Fields
- ◆ Research activity on various subjects (from beam physics to measurement techniques) as associate with INFN and various CERN groups



UNIVERSITÀ DEGLI STUDI DI NAPOLI  
**FEDERICO II**



Istituto Nazionale  
di Fisica Nucleare

# From Rutherford to Colliders: the Riveting Story of Accelerators

**Prof. Vittorio Giorgio VACCARO**

*Seminar on “History of particle accelerators”,  
JUAS (Joint Universities Accelerator School),  
Archamps (close to CERN)*

07/01/2019

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1

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ISR-RF/66-35

**November 18, 1966**

**LONGITUDINAL INSTABILITY OF A COASTING BEAM ABOVE TRANSITION, DUE TO THE ACTION OF LUMPED DISCONTINUITIES**

**by V.G. Vaccaro**

1. Generalities

We assume that the electrical action on an ion beam, of a discontinuity in a tank is that of an impedance. We still consider the

where  $a$  is the beam radius. The passage of an ion beam induces a field in the discontinuity, which is given by:

$$E_d = -Z I/a, \tag{4}$$

where  $d$  is the magnitude of the discontinuity, and  $Z$  is the impedance of the discontinuity.

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REFERENCES

1) V.K. Neil and A.M. Sessler  
Longitudinal Resistive Instabilities of Intense Coasting Beams in Particle Accelerator  
Rev. Sci. Instr. 36, 429 (1965)

1) A.M. Sessler and V.G. Vaccaro  
Longitudinal Instabilities of Azimuthally Uniform Beams in Circular Vacuum Chambers of Arbitrary Electrical Properties (in preparation).

Distribution: (closed) AR and ISR Scientific Staff

1

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CERN 67-2  
ISR-Division

**February 6, 1967**

ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE  
**CERN** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

**LONGITUDINAL INSTABILITIES OF  
AZIMUTHALLY UNIFORM BEAMS IN CIRCULAR  
VACUUM CHAMBERS WITH WALLS OF  
ARBITRARY ELECTRICAL PROPERTIES**

by

**A. Sessler and V. Vaccaro**

**A. Sessler passed away  
just before the workshop  
(17/04/2014)**

**Impedance workshop, Erice, Sicily, 24-28/04/2014**

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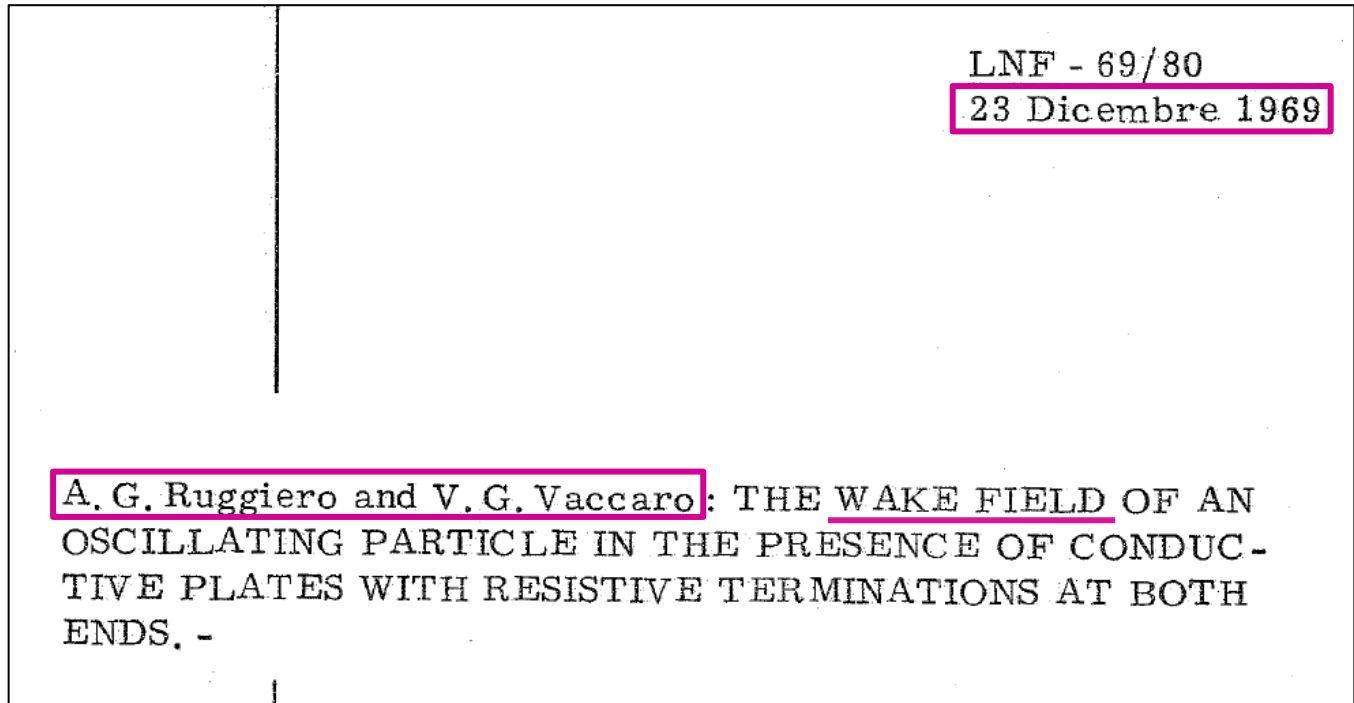
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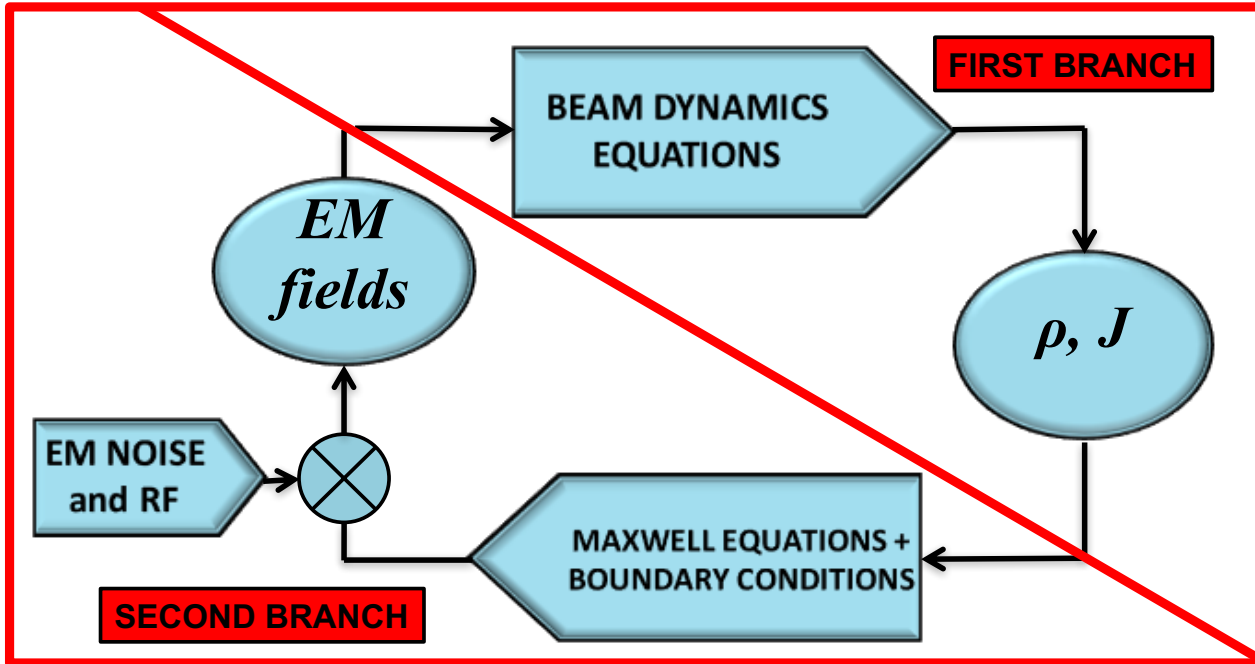
LNF - 69/80  
23 Dicembre 1969

A. G. Ruggiero and V. G. Vaccaro: THE WAKE FIELD OF AN OSCILLATING PARTICLE IN THE PRESENCE OF CONDUCTIVE PLATES WITH RESISTIVE TERMINATIONS AT BOTH ENDS. -



1

‘For his pioneering studies on instabilities in particle beam physics, the introduction of the impedance concept in storage rings and, in the course of his academic career, for disseminating knowledge in accelerator physics throughout many generations of young scientists.’



2

“For his pioneering studies on instabilities in particle beam physics, the introduction of the impedance concept in storage rings and, in the course of his academic career, for disseminating knowledge in accelerator physics throughout many generations of young scientists.”

ISR-TH/68-35

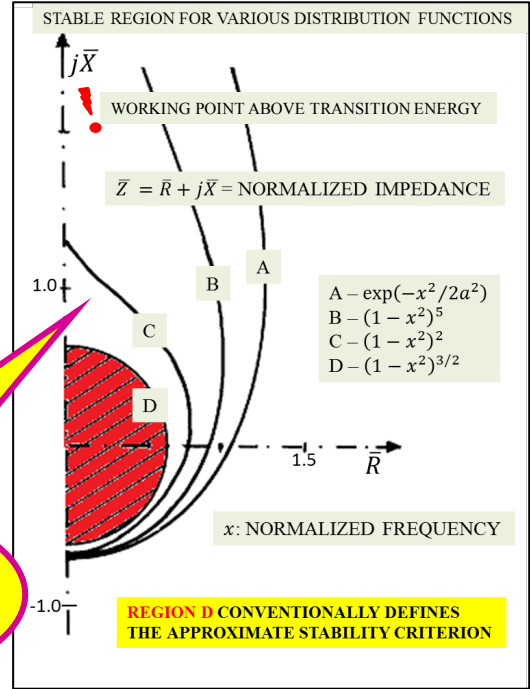
**SOLUTION OF THE DISPERSION RELATION FOR  
LONGITUDINAL STABILITY OF AN INTENSE  
COASTING BEAM IN A CIRCULAR ACCELERATOR  
(APPLICATION TO THE ISR)**

by

**A.G. Ruggiero and V.G. Vaccaro**

Geneva - 1<sup>st</sup> July, 1968

Universal maps  
of stability (“stability  
charts or diagrams”)



2

*‘For his pioneering studies on instabilities in particle beam physics, the introduction of the impedance concept in storage rings and, in the course of his academic career, for disseminating knowledge in accelerator physics throughout many generations of young scientists.’*

CERN-ISR-TH-RF-69-23 ; ISR-TH-RF-69-23

**Stability of the coherent transverse motion of a coasting beam for realistic distribution functions and any given coupling with its environment**

Hübner, K (CERN) ; Ruggiero, A G (CERN) ; Vaccaro, V G (CERN)

3 Jul 1969. - 7 p.

7th International Conference on High-Energy Accelerators, Yerevan, USSR, 27 Aug - 2 Sep 1969, pp.343-352

CERN-ISR-RF-TH-70-2 ; ISR-RF-TH-70-2

**Concerning the stability of the ISR beam against coherent dipole oscillations**

Hübner, K ; Strolin, P ; Vaccaro, Vittorio G ; Zotter, Bruno W

(CERN)

22 Jan 1970. - 37 p.

CERN-ISR-TH-70-44 ; ISR-TH-70-44

**Dispersion relations and stability of coasting particle beams**

Hübner, K ; Vaccaro, V G

25 Aug 1970. - 33 p.

2

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 **Impedance and instability workshop, Benevento, Italy, 2017** 

**The Birth and the Childhood of the Coupling Impedance and the Stability Maps**

**Vittorio G. Vaccaro**

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II  
and INFN- SEZ. DI NAPOLI

19/09/2017 1

3

*‘For his pioneering studies on instabilities in particle beam physics, the introduction of the impedance concept in storage rings and, in the course of his academic career, for disseminating knowledge in accelerator physics throughout many generations of young scientists.’*

### My best scientific production

- Luigi Palumbo (U. Rome)
- Godehard Wuestefeld (Bessy)
- Caterina Biscari (Alba)
- Eliana Gianfelice (Fermilab)
- M. Rosaria Masullo (INFN)
- Augusto Lombardi (INFN)
- Antonio Palmieri (INFN)
- Roberto Losito (CERN)
- Giovanni Rumolo (CERN)
- Alessandro D’Elia (ESRF)
- Marco Panniello (INFN)
- Claudio Serpico (Elettra)
- Carlo Zannini (Adam)
- Giovanni De Michele (Adam)
- Serena Persichelli (LBNL)
- Mauro Migliorati (Roma)
- Andrea Passarelli (CERN)
- Renato Prisco (Lund)
- Nicolò Biancacci (CERN)

3

“For his pioneering studies in particle beam physics, the introduction of the concept of the **mentor** in the course of his academic career has been a landmark in accelerator physics throughout many generations of young scientists.”

**Vittorio was the MENTOR of many students who have now important positions in various accelerator centers**

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1<sup>st</sup> generation

2<sup>nd</sup> generation

3<sup>rd</sup> generation

3



E. Métral, IPAC'19, Melbourne, Australia, 23/05/2019



3




E. Métral, IPAC'19, Melbourne, Australia, 23/05/2019

# 3 MESSAGE FROM THE JUAS: JOINT UNIVERSITIES ACCELERATOR SCHOOL

- ◆ “All of the JUAS team in Archamps join together in congratulating you on winning the ACFA/IPAC 2019 Xie Jialin Prize. This award comes as a fitting and fully-deserved tribute to your lifelong contribution to the field of particle accelerators. Your commitment to JUAS over the years is a perfect illustration of this.”



On the 15th and 16th of April 2019, the ALBA Synchrotron brought together teachers that are members of the advisory board of the Joint Universities Accelerator School (JUAS), a training programme in partnership with CERN and 16 European universities.



EXPERTS ON PARTICLE ACCELERATORS MEET IN ALBA

A wide-angle photograph of the ALBA synchrotron facility interior, showing a large, industrial-scale structure with a complex network of pipes and metal walkways.

[HOME](#) / [MEDIA](#) / [NEWS](#) / [EXPERTS ON PARTICLE ACCELERATORS MEET IN ALBA](#)



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# CURRENTLY WORKING ON A MOOC

(Massive Open Online Course)

- ◆ Vittorio is preparing a MOOC on Electromagnetism (within the European Union H2020 project ARIES)



**MANY THANKS FOR ALL VITTORIO  
AND CONGRATULATIONS AGAIN!**



E. Métral, IPAC'19, Melbourne, Australia, 23/05/2019