Analisi di un circuito RLC serie in regime sinusoidale

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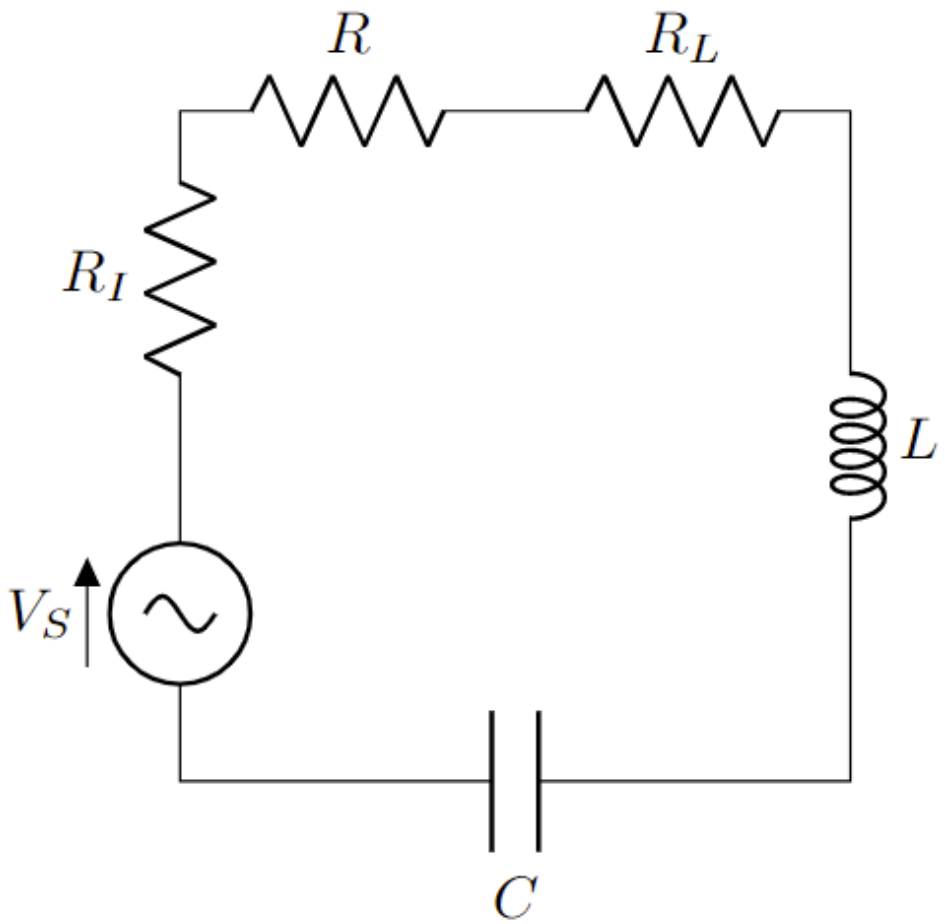
Presentazione

Circuito



$R_I = 50\Omega$

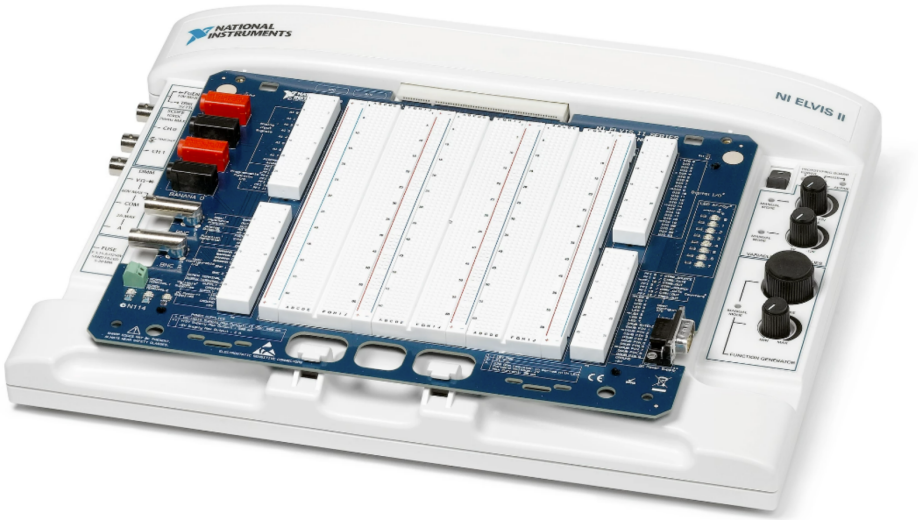
$R = (330.0 \pm 0.3)\Omega$

$R_L = (34.5 \pm 0.1)\Omega$

$L = (10.3 \pm 0.1)mH$

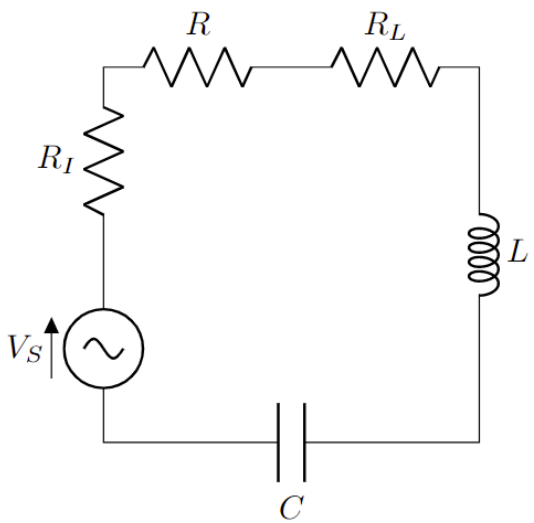
$C = (45.5 \pm 0.4)nF$

Acquisizione e analisi



- Scheda Elvis II
- Programma scritto in LabVIEW
- Dati elaborati con il softwere ROOT

Svolgimento



$$V(t) = V_0 \cos wt$$

$$i(t) = \frac{V_0}{\sqrt{R^2+(wL-\frac{1}{wC})^2}} \cos\left[wt + (\arctan\frac{1-w^2LC}{wRC})\right]$$

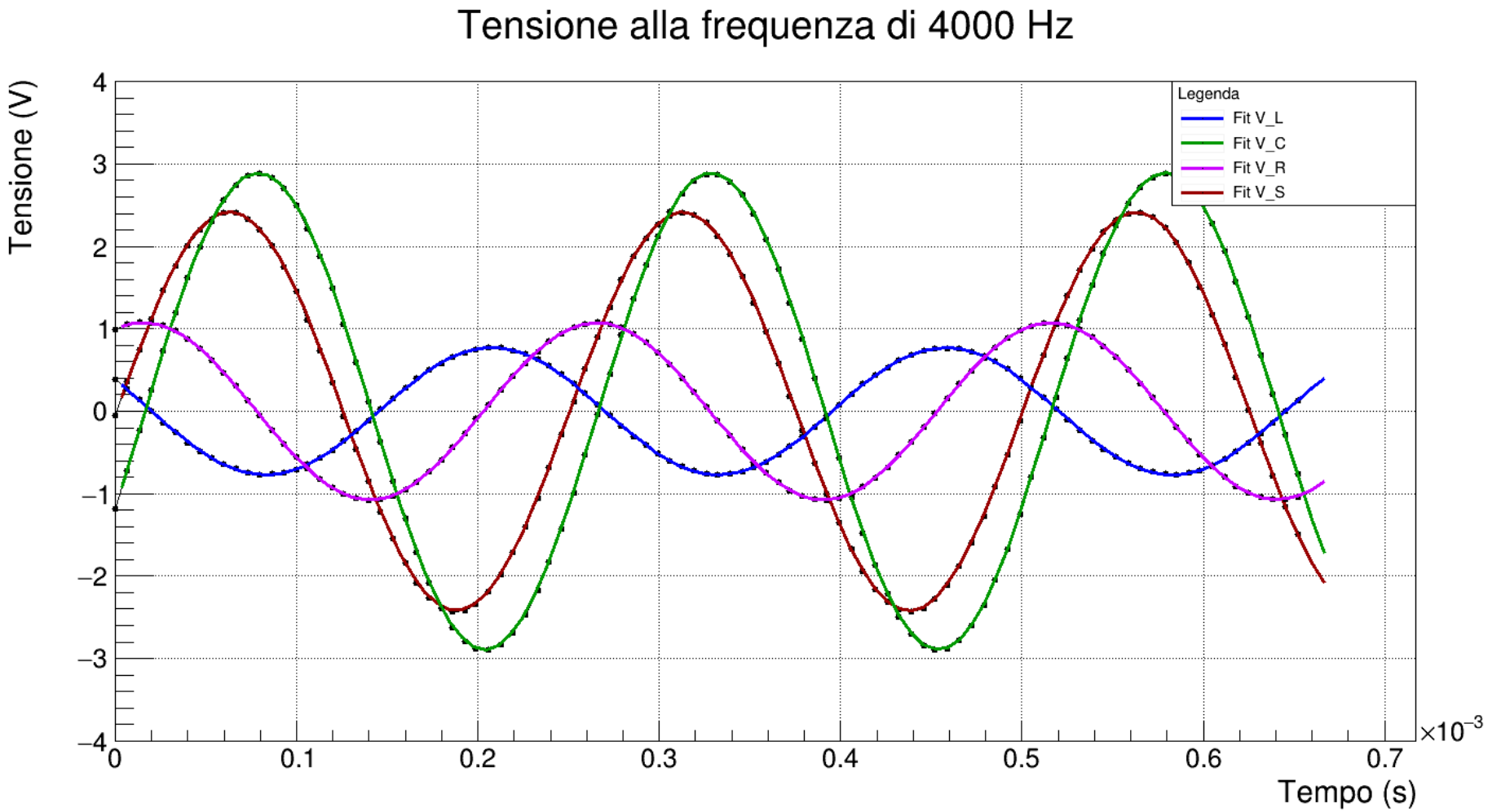
$$R(w) = \frac{1}{1+q^2(\frac{w_0}{w}-\frac{w}{w_0})} \qquad q = \frac{w_0 L}{R} = \frac{1}{R}\sqrt{\frac{L}{C}}$$

$$w_0 = \frac{1}{\sqrt{LC}}$$

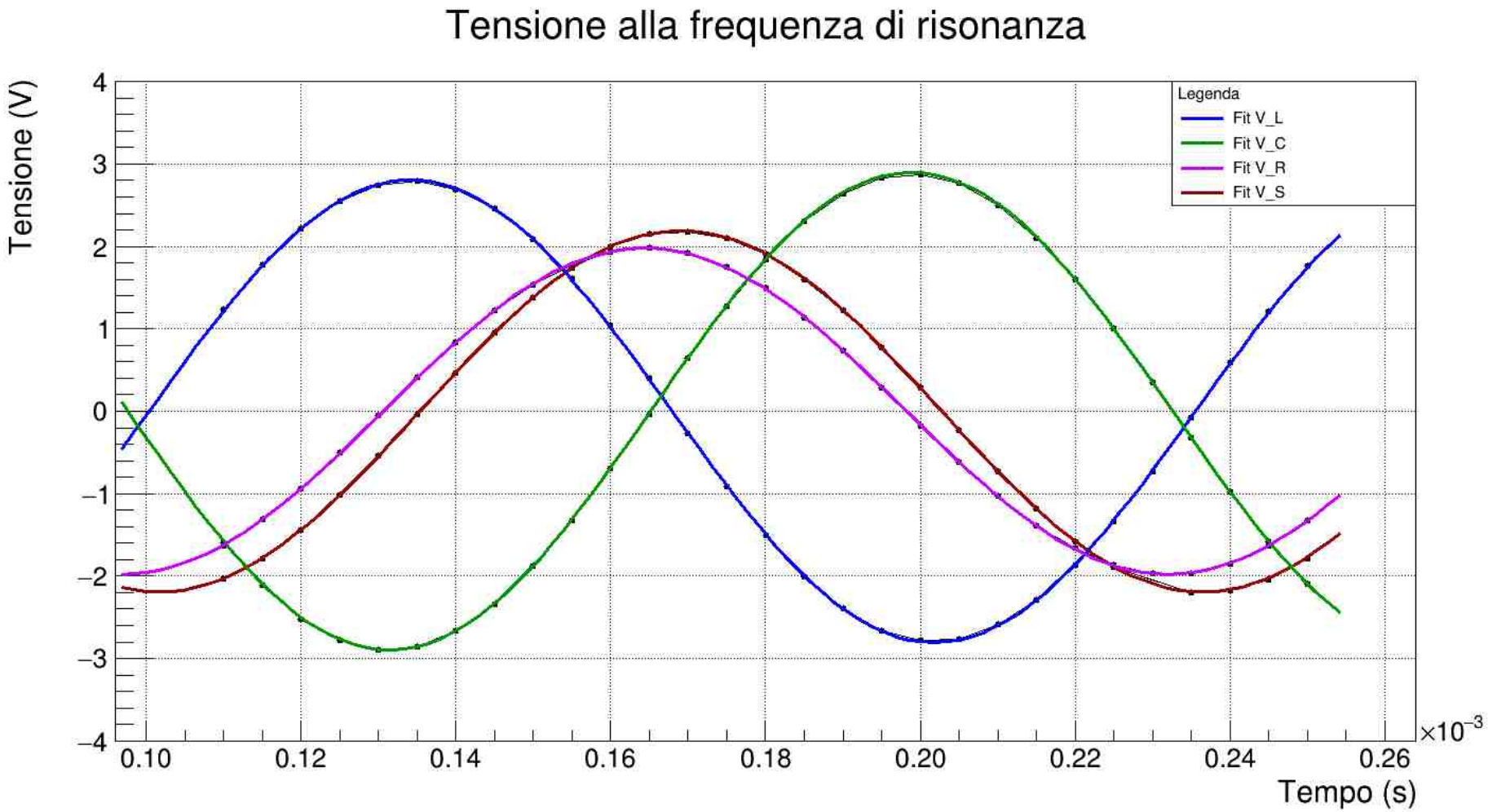
Nel caso del nostro circuito

$$q \approx 1.5 \qquad f_0 = (7351 \pm 68)Hz$$

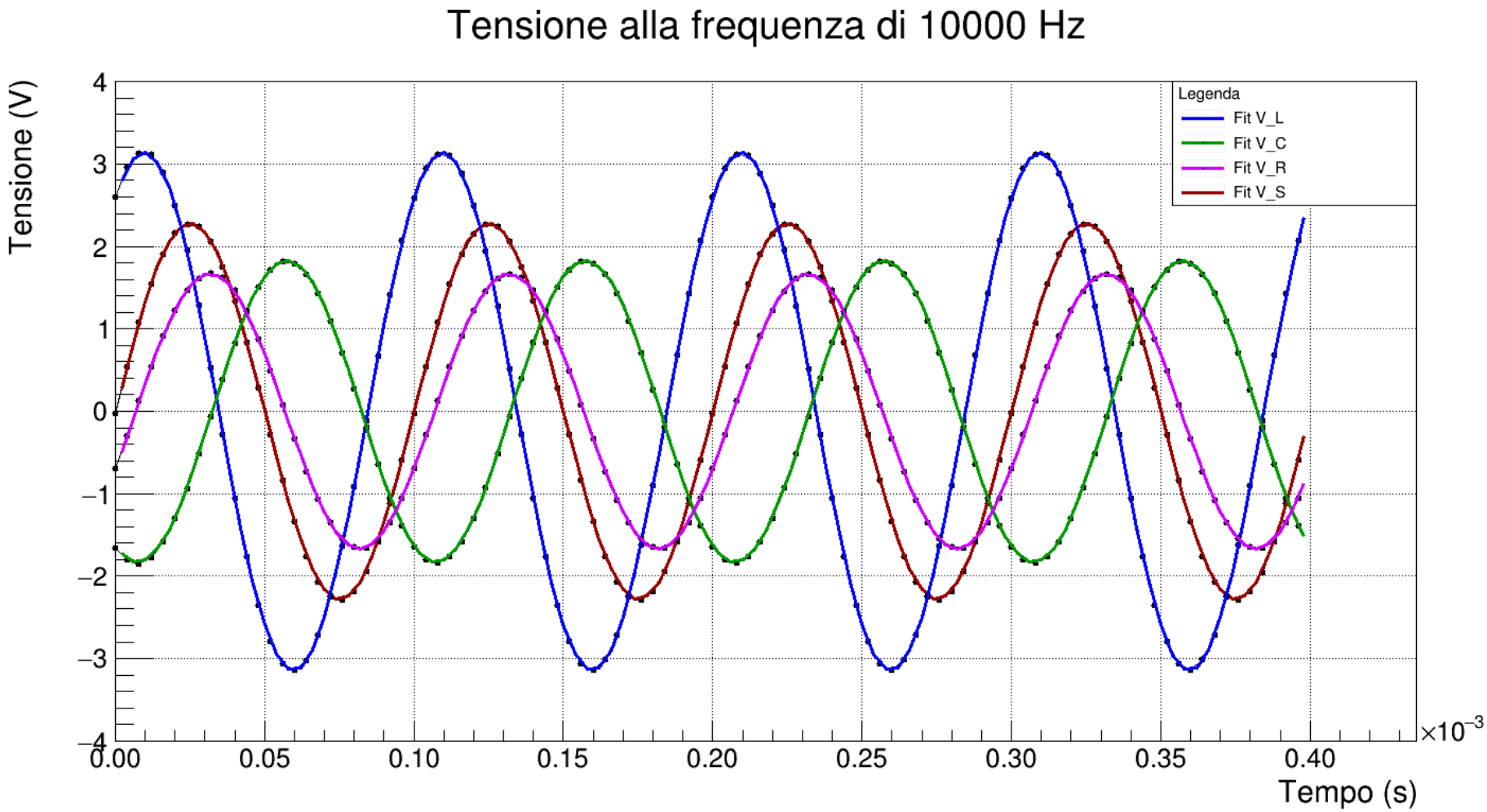
Studio qualitativo: 4000*Hz*



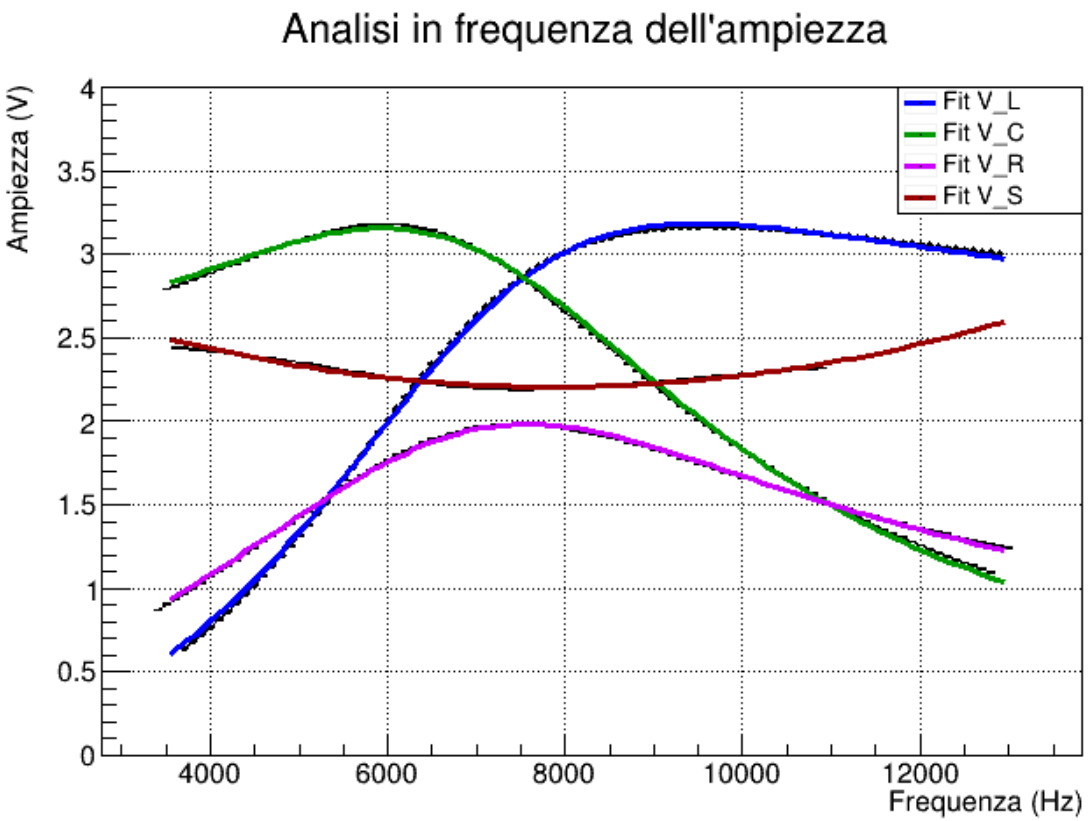
Studio qualitativo: f_0



Studio qualitativo: 10000Hz



Analisi dell'ampiezza



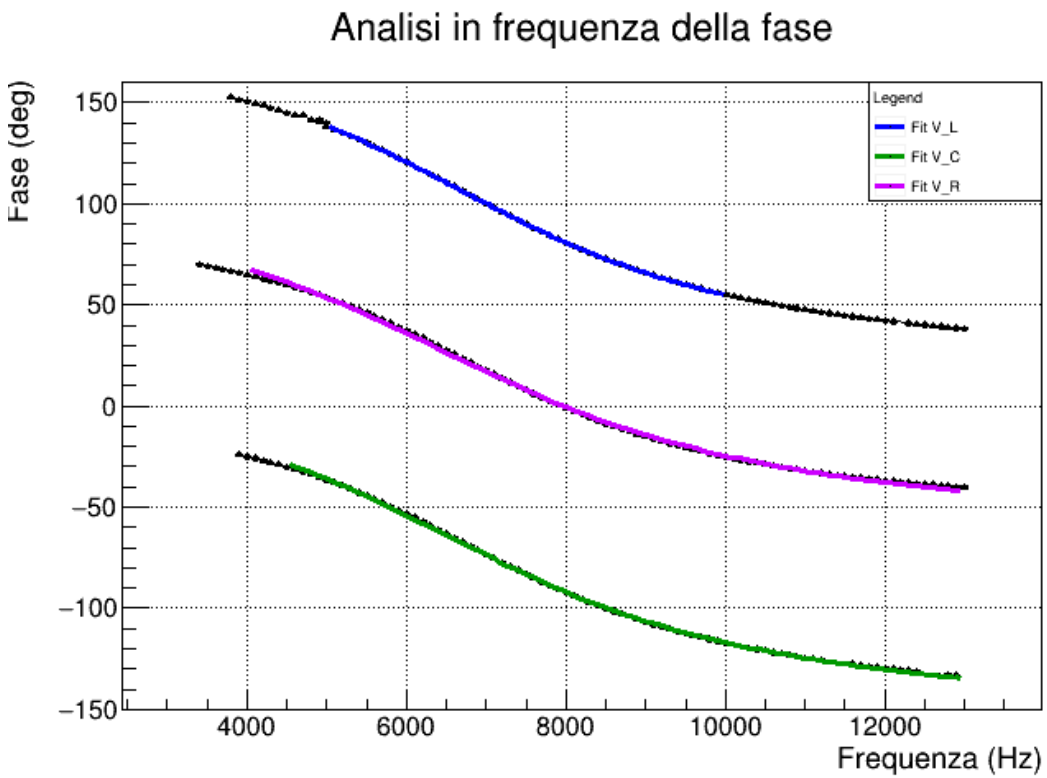
$$A_R(w) = \frac{V_0 R}{\sqrt{R^2+(wL-\frac{1}{wC})^2}}$$

$$A_L(w) = \frac{V_0 wL}{\sqrt{R^2+(wL-\frac{1}{wC})^2}}$$

$$A_C(w) = \frac{\frac{V_0}{wC}}{\sqrt{R^2+(wL-\frac{1}{wC})^2}}$$

$$f_0 s = (7562 \pm 5) Hz$$

Analisi della fase



$$\Phi_R(w) = \arctan \frac{1-w^2LC}{wRC}$$

$$\Phi_L(w) = \arctan\left(\frac{1-w^2LC}{wRC}\right) + \frac{\pi}{2}$$

$$\Phi_C(w) = \arctan\left(\frac{1-w^2LC}{wRC}\right) - \frac{\pi}{2}$$

Conclusioni: problematiche e possibili soluzioni

Definition

A prime number is a number that has exactly two divisors.

Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (three divisors: 1, 2, and 4).

You can also use the `theorem`, `lemma`, `proof` and `corollary` environments.

Analisi dati

Heading

1. Statement
2. Explanation
3. Example

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer lectus nisl, ultricies in feugiat rutrum, porttitor sit amet augue. Aliquam ut tortor mauris. Sed volutpat ante purus, quis accumsan dolor.

The End

Questions? Comments?