Bounds on the Helmholtz equation with nontrapping wavespeed

(with Ivan Graham and Euan Spence, Bath)

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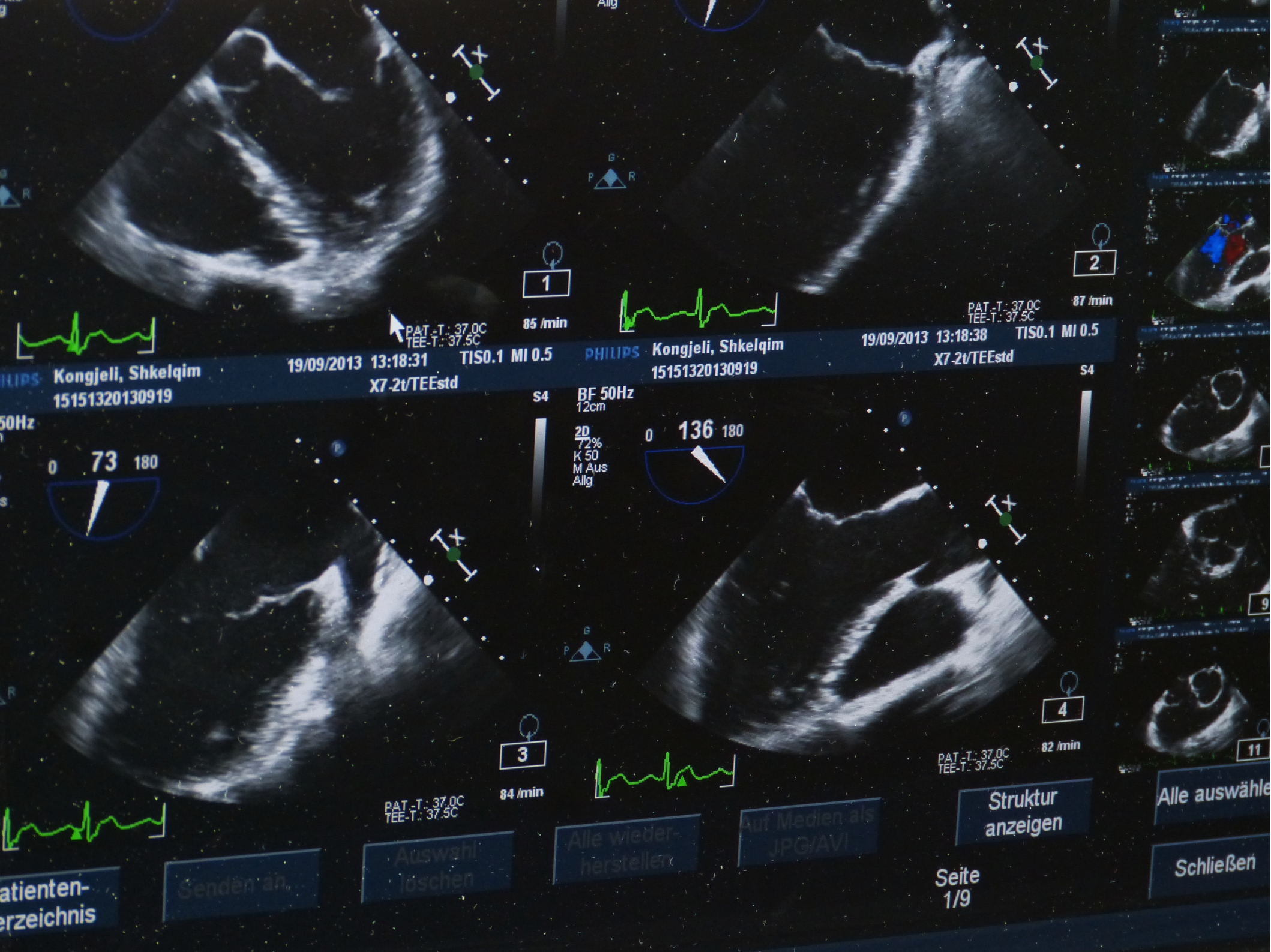
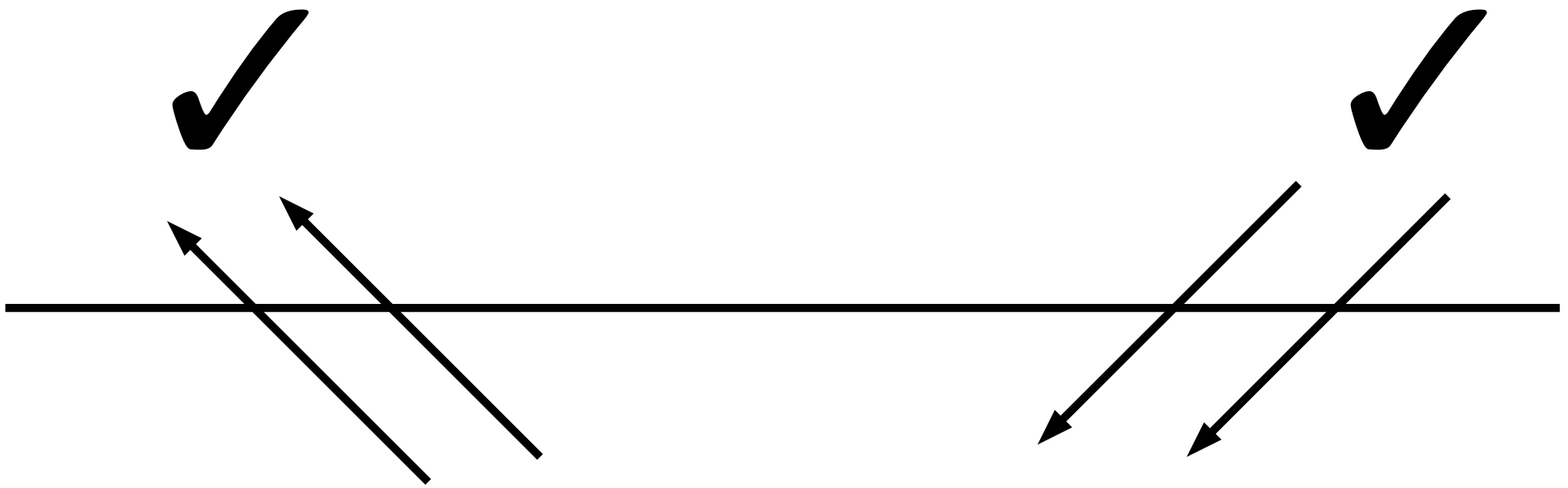
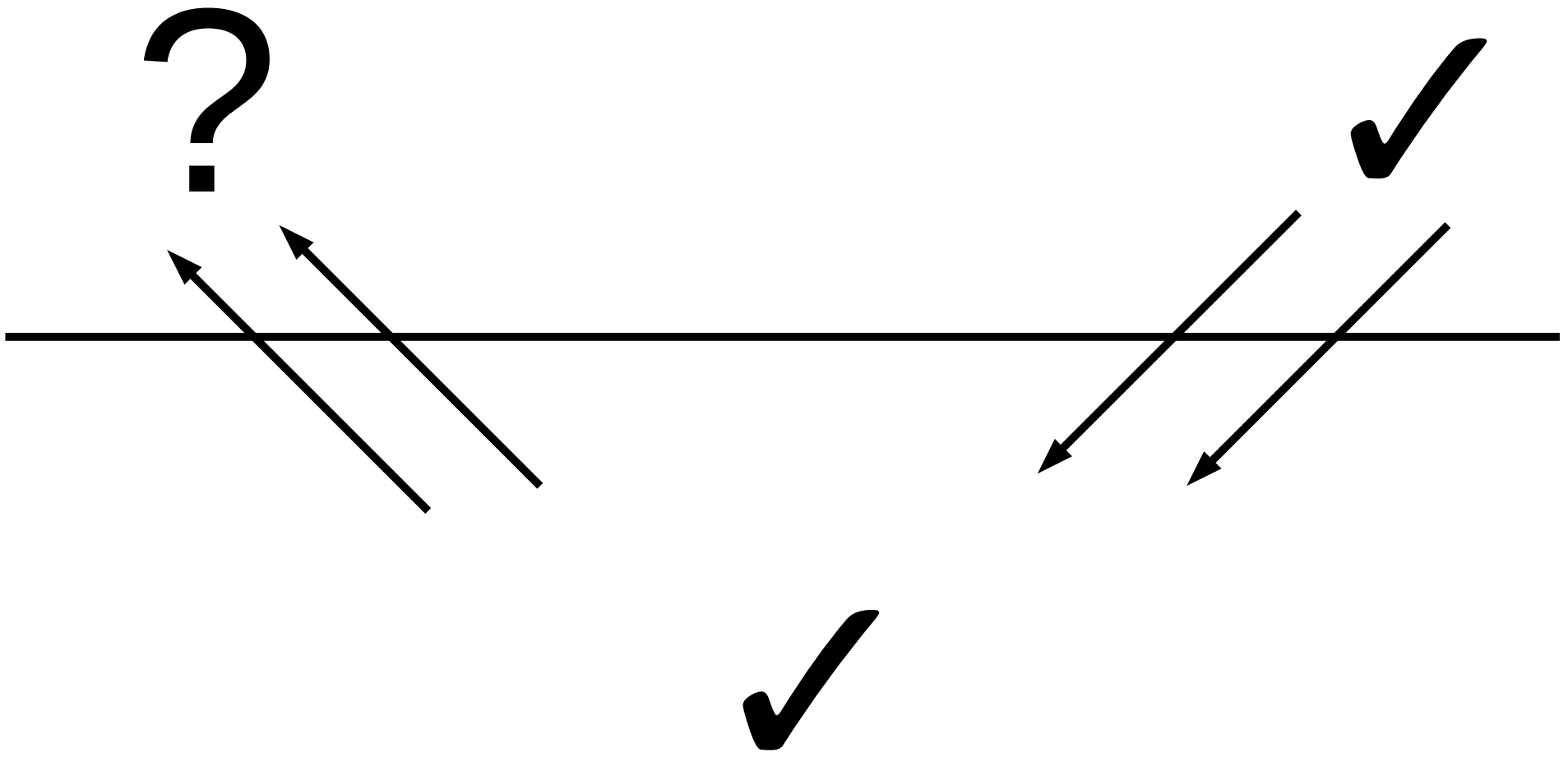

Kongjeli, Shkelqim
15151320130919
19/09/2013 13:18:31
X7-2t/TEEstd
TIS0.1 MI 0.5
PAT.-T.: 37.0C
TEE-T.: 37.5C
85 /min
BF 50Hz
12cm
2D
72%
K 50
M Aus
Allg
73
136
84 /min
82 /min
Struktur anzeigen
Auswahl löschen
Alle wieder-herstellen
Auf Medien als JPG/AVI
Senden an...
Schließen
Seite 1/9



?

Inverse Problem

Forward Problem



1. Fast Algorithms

2. Prove they work

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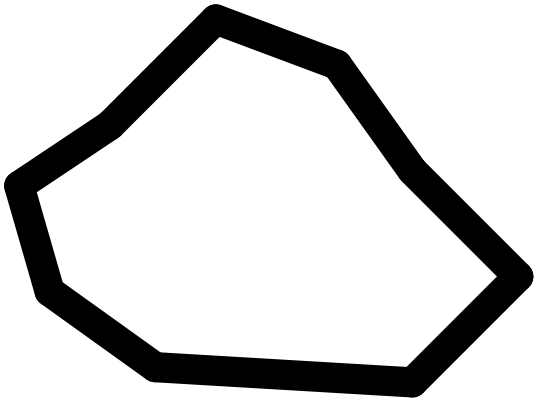
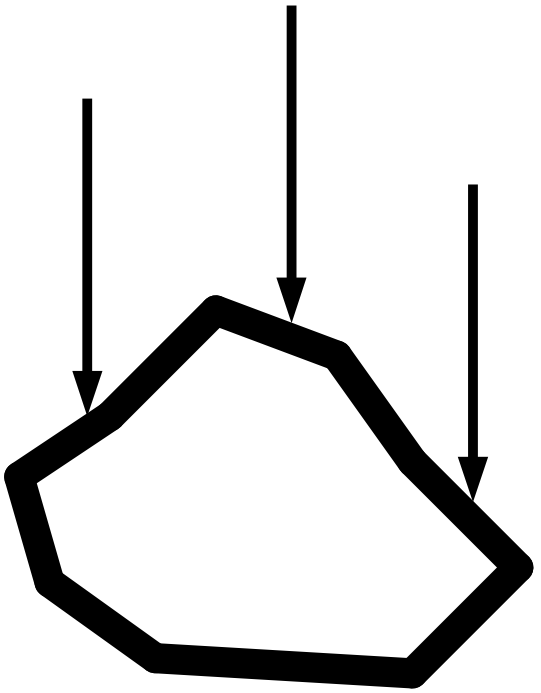
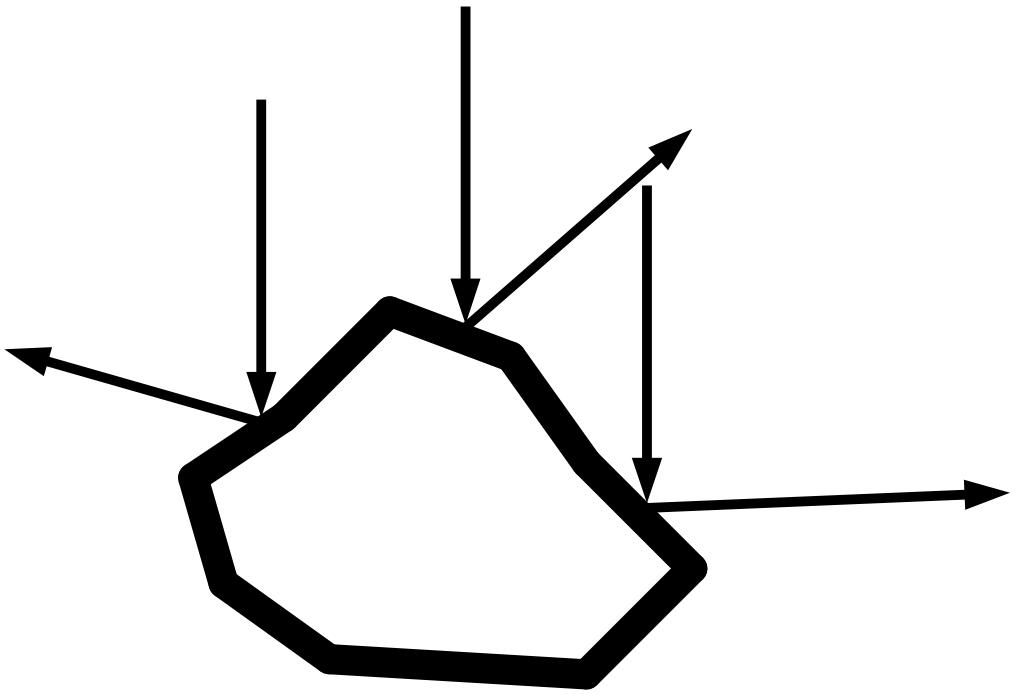
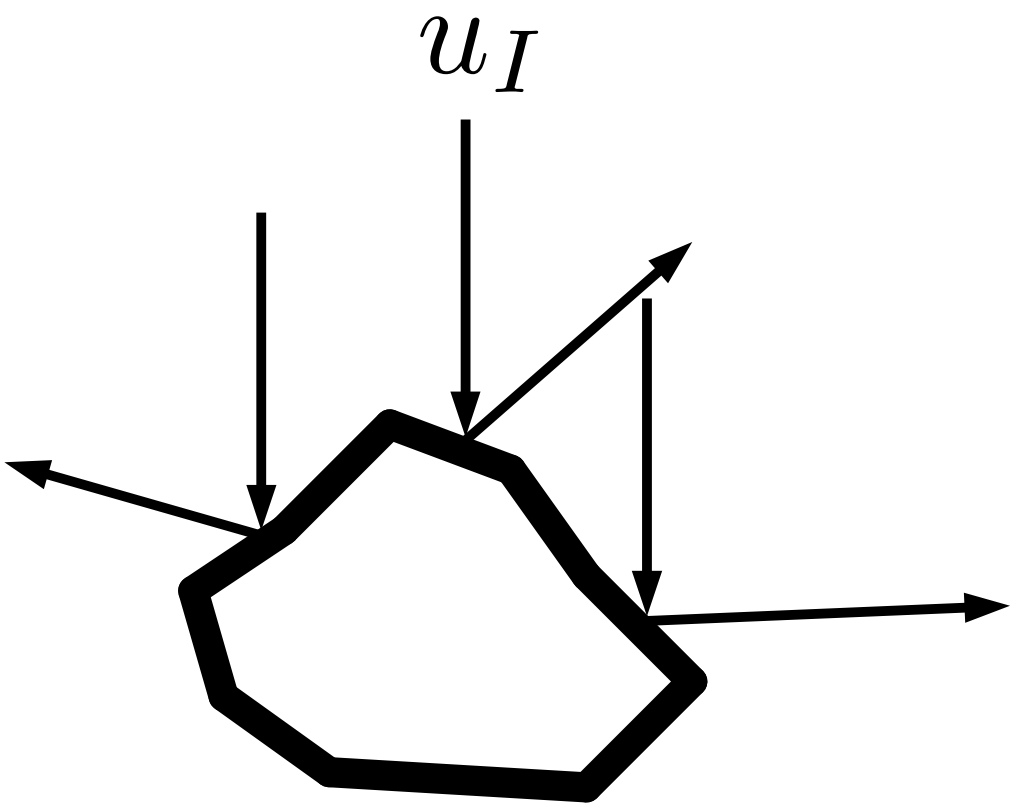
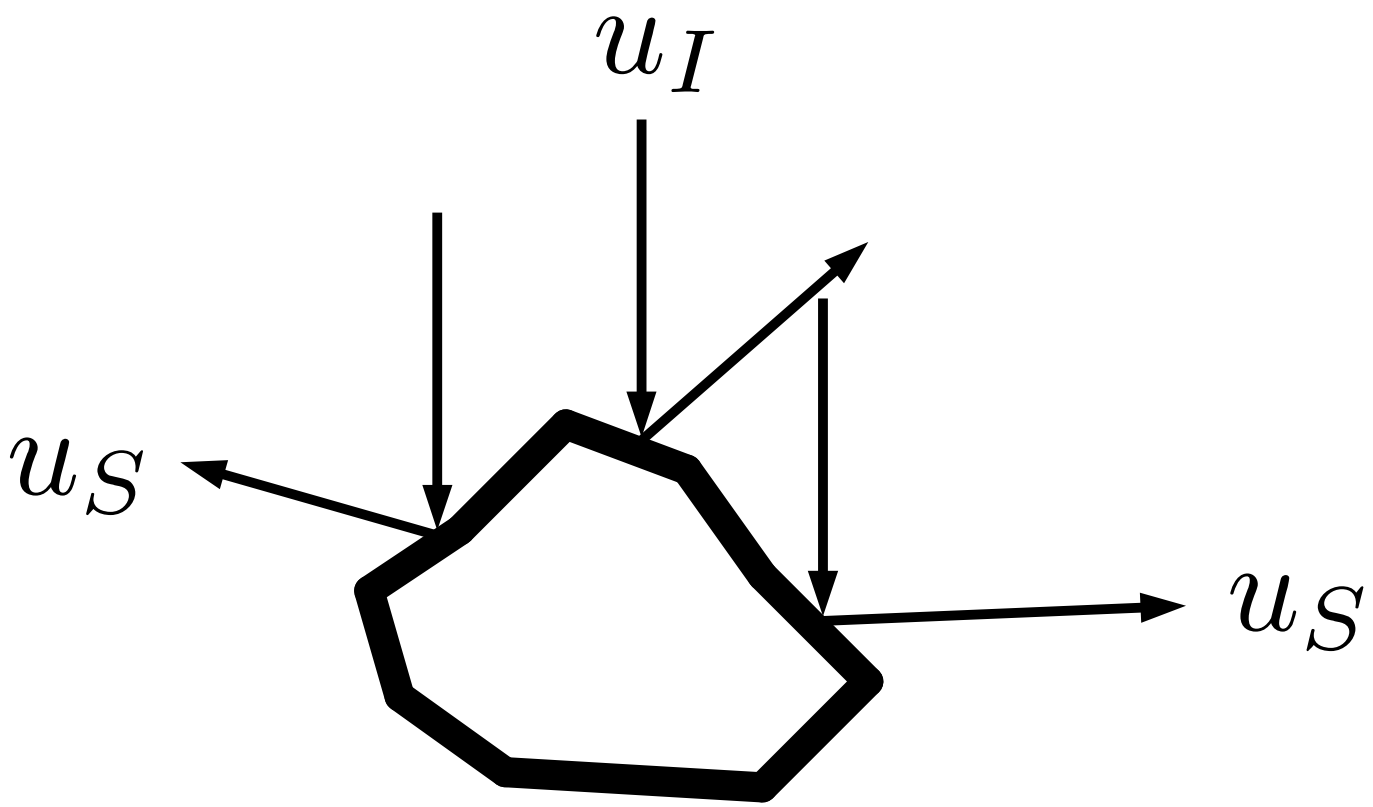







u_I


u_I
u_S
u_S

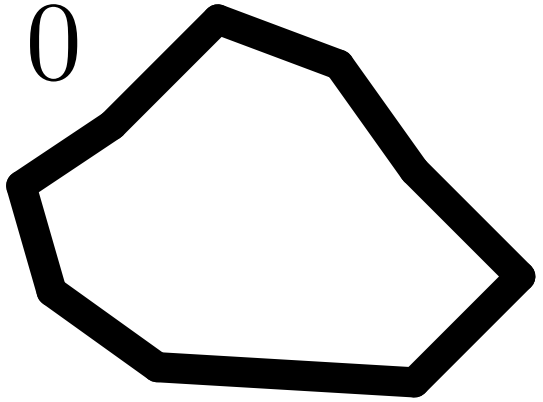
$$u = u_I + u_S$$

$$\Delta u + \frac{\omega^2}{c^2} u = -f$$

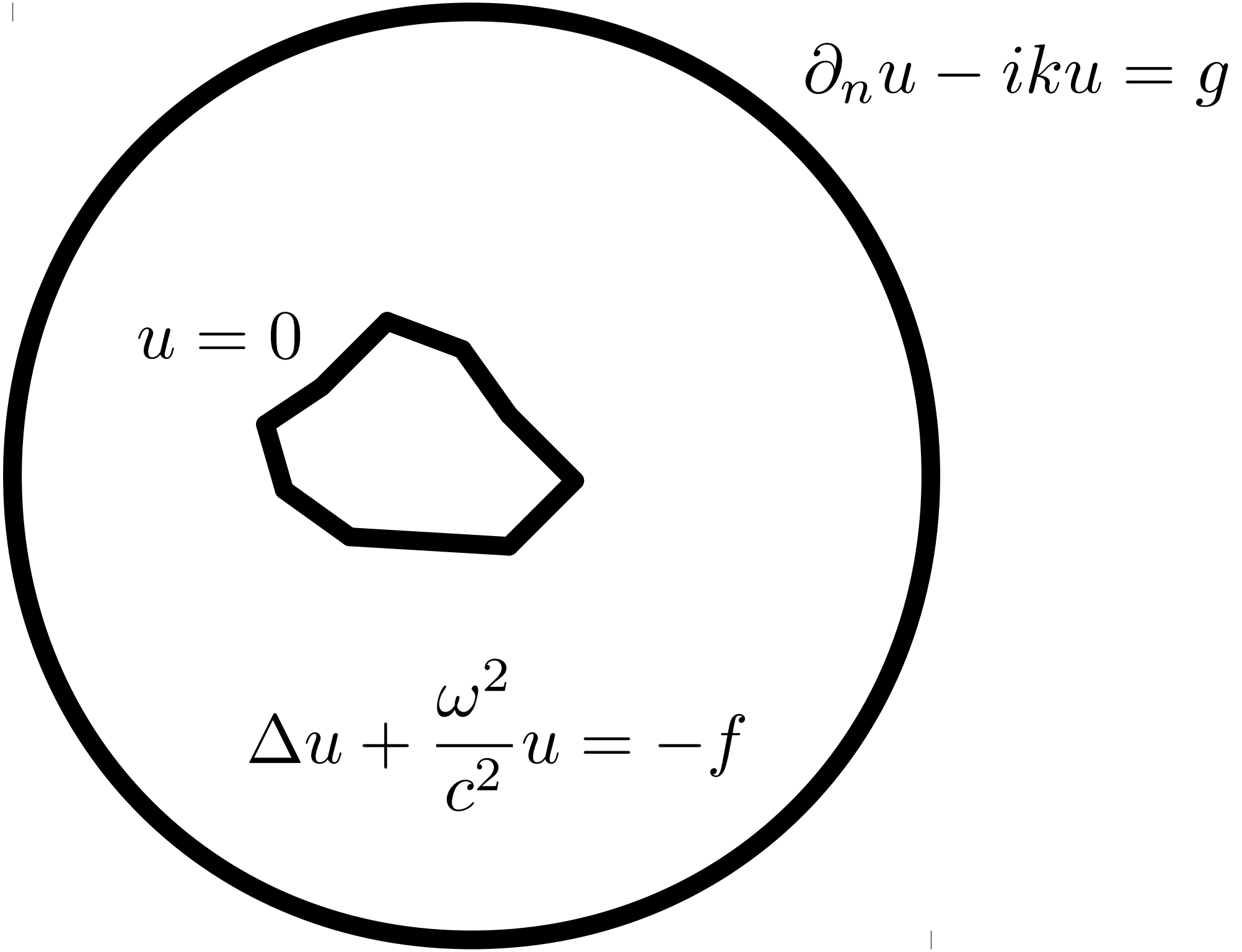
$$+ \text{BCs}$$

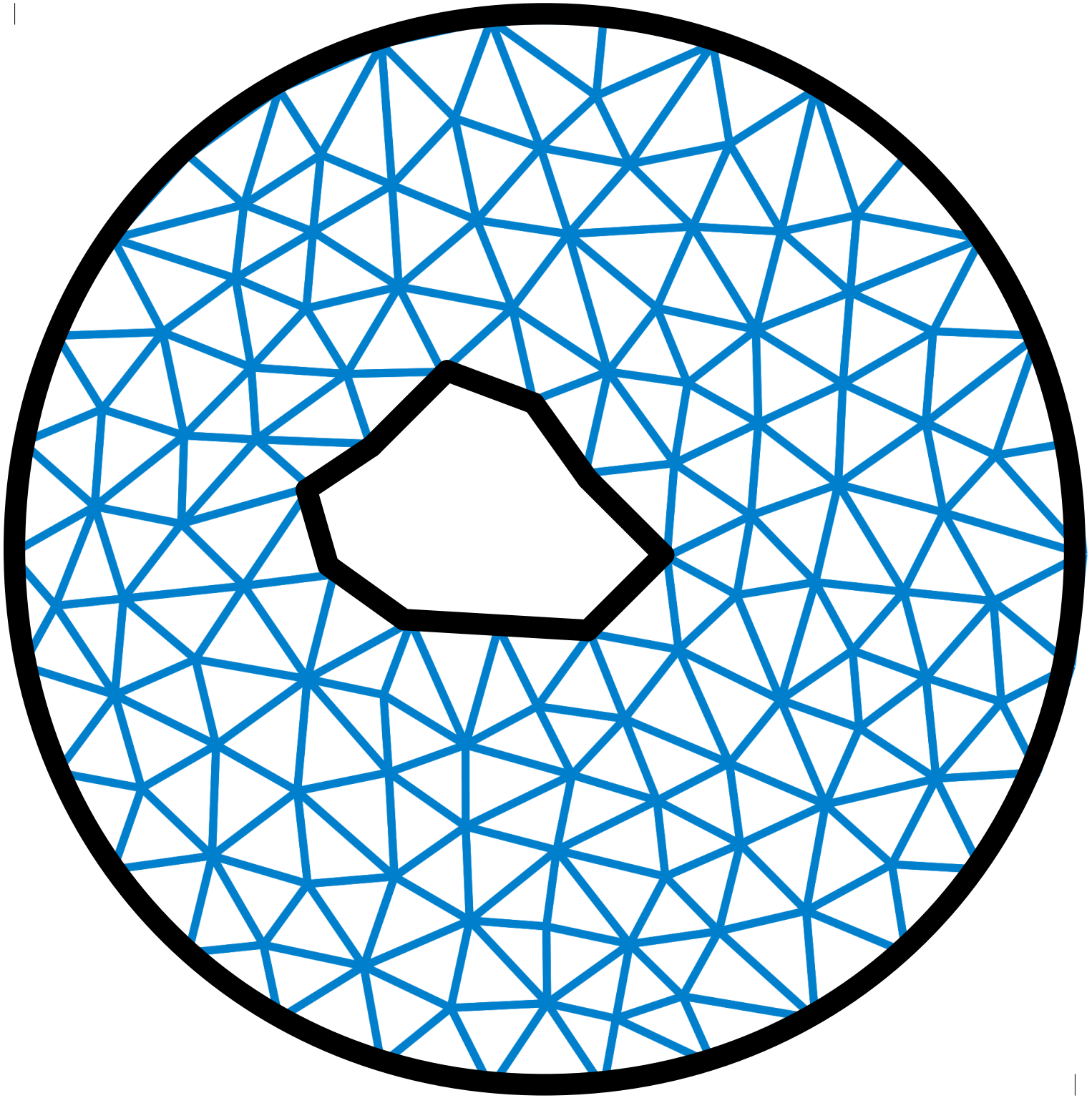
+ condition “at infinity”

$u = 0$



$$\Delta u + \frac{\omega^2}{c^2} u = -f$$


$\partial_n u - iku = g$
$u = 0$
$\Delta u + \frac{\omega^2}{c^2} u = -f$



Prove it works

PDE Bounds

$$\|u\| \leq C \|f\| + D \|g\|$$

Independent of ω, c

When?

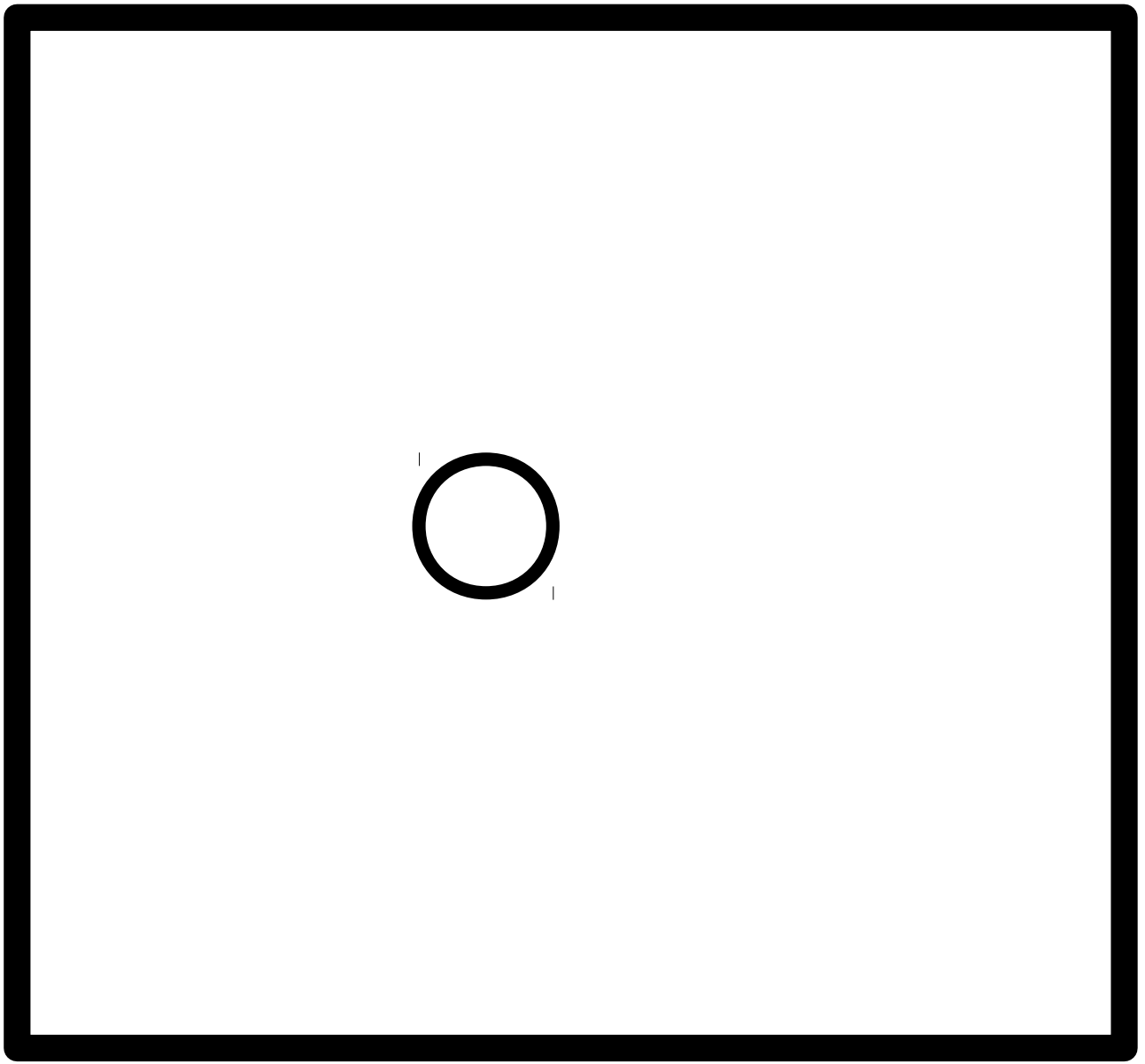
Why not?

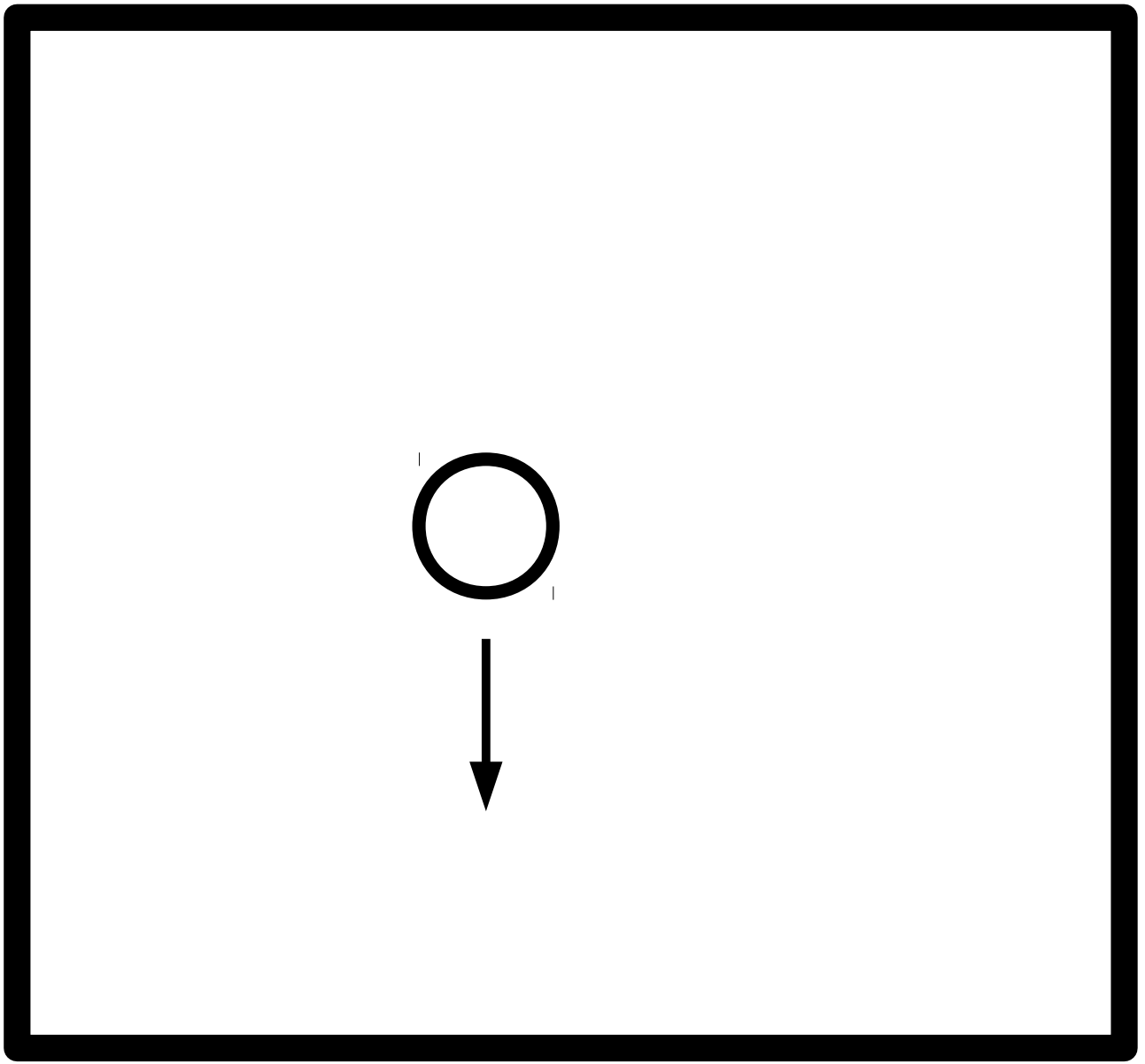
Resonance

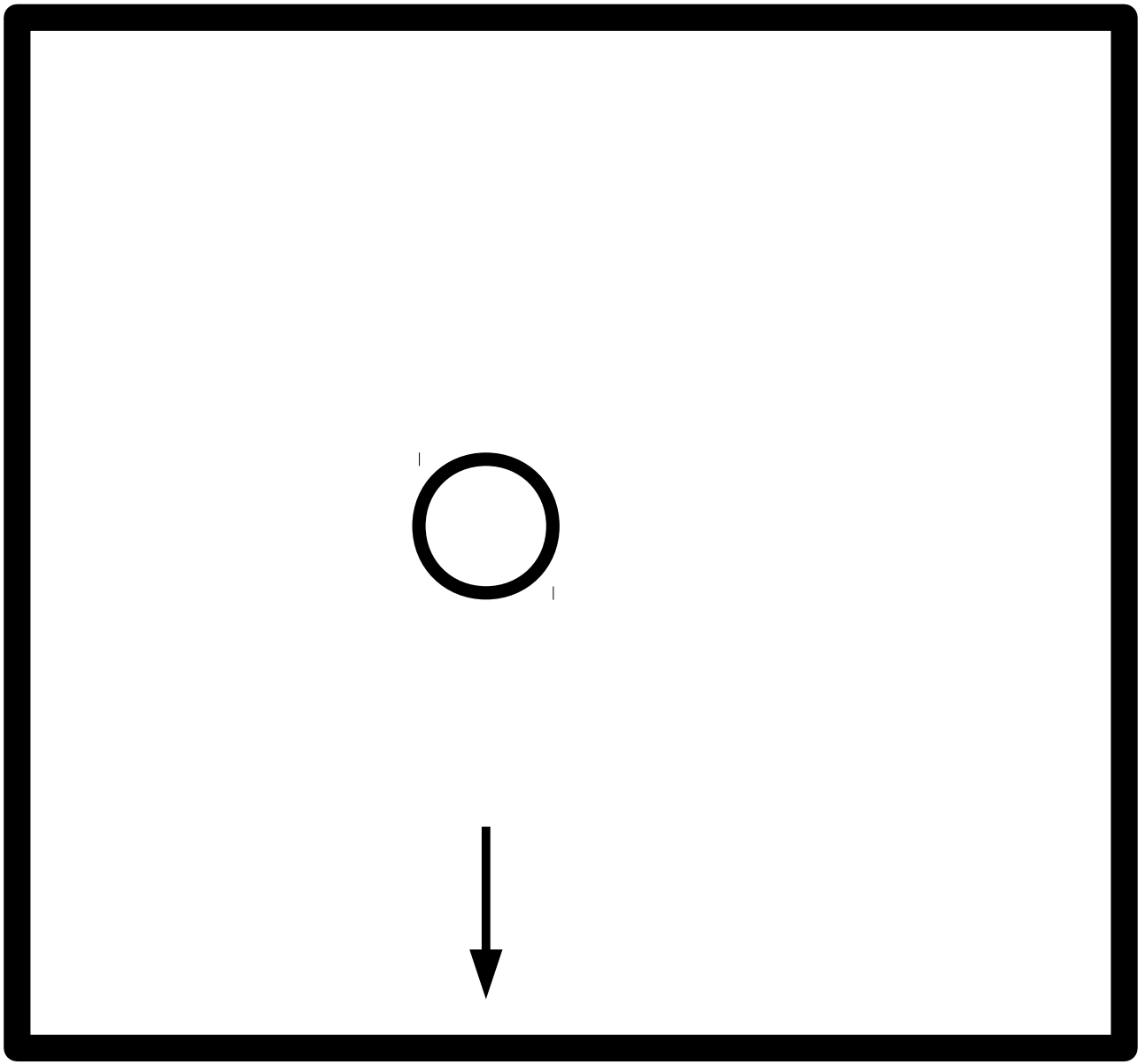
$$\|u\| \leq C \|f\| + D \|g\|$$

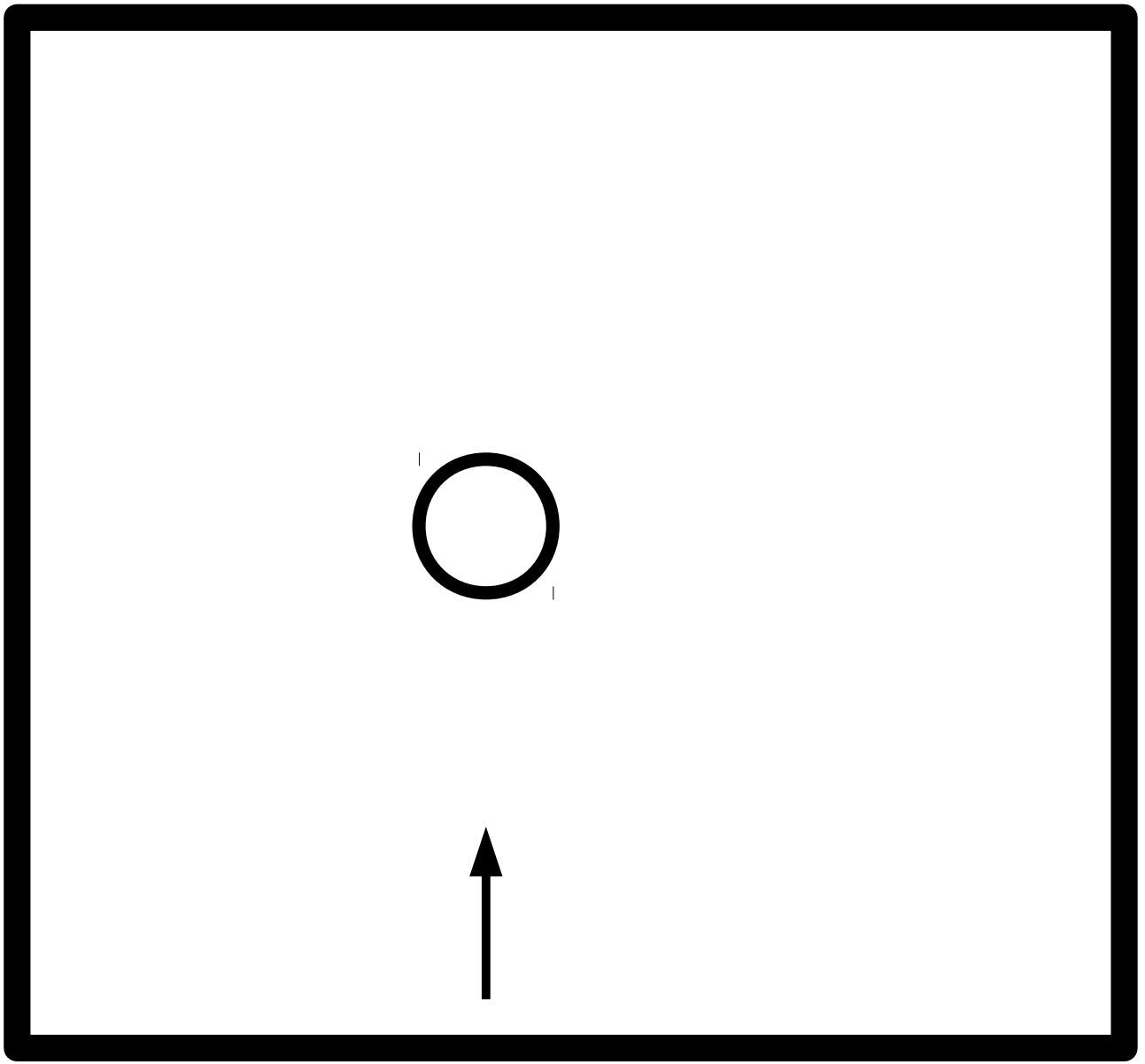
Independent of ω, c

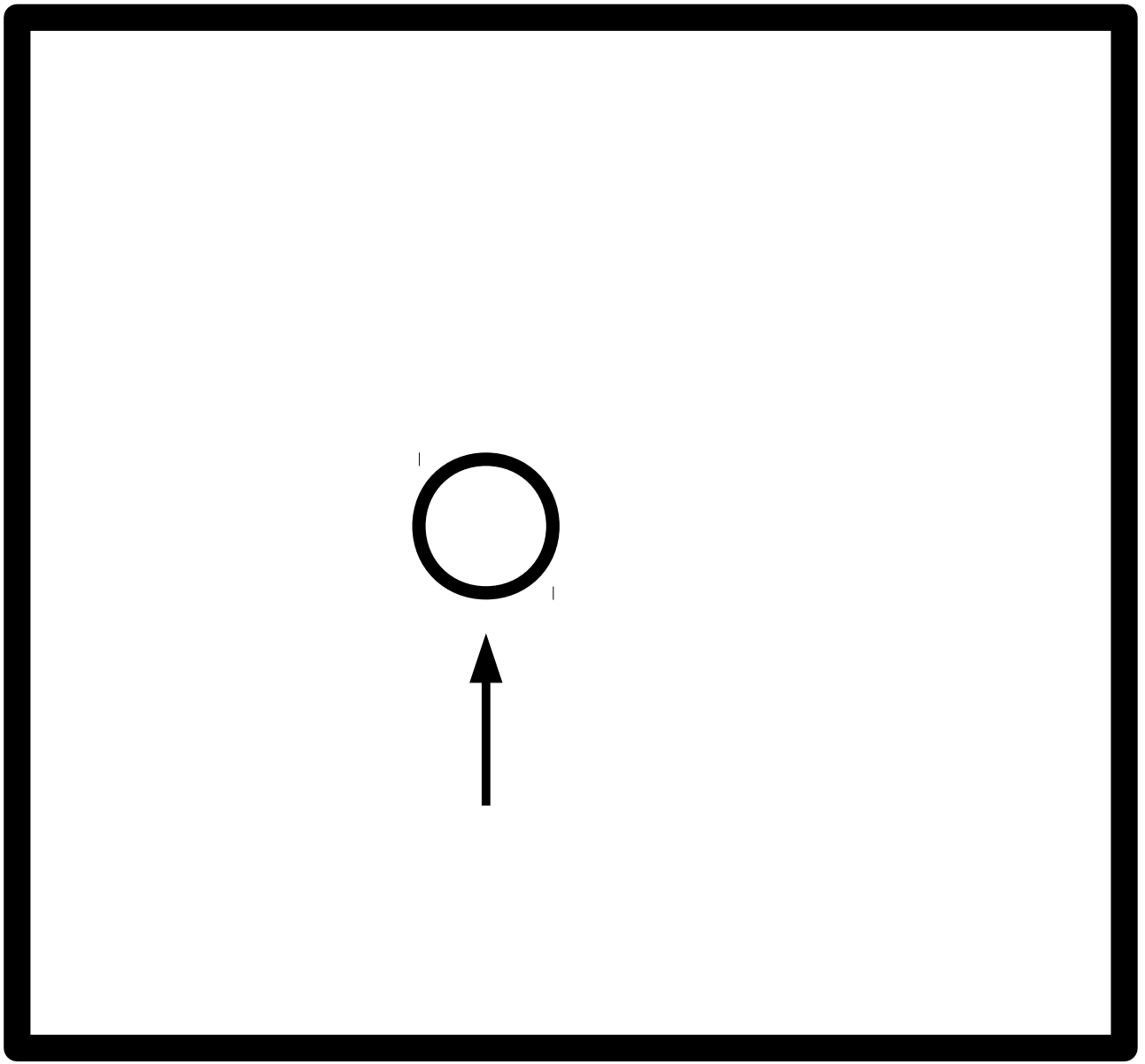
Rays

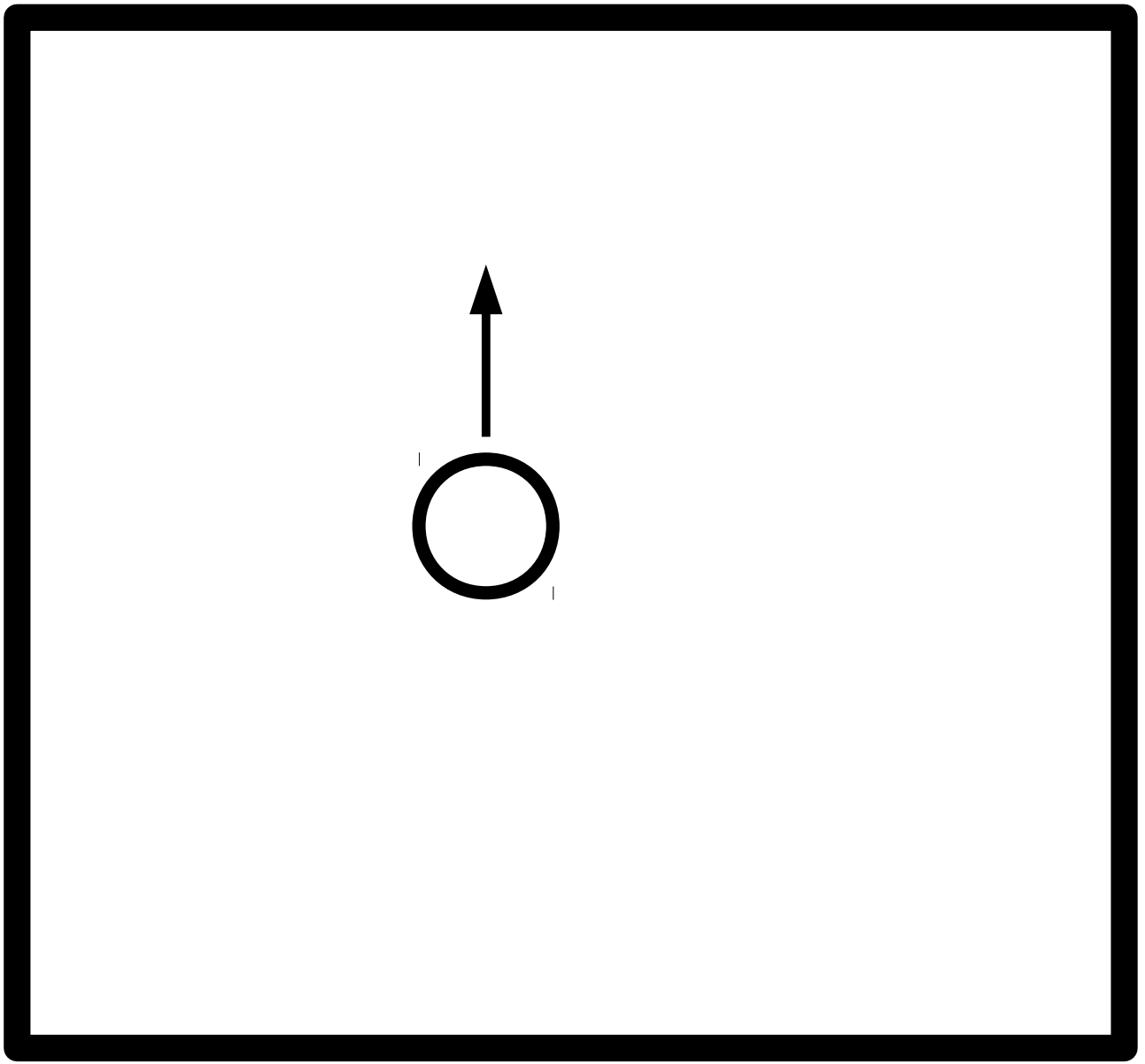


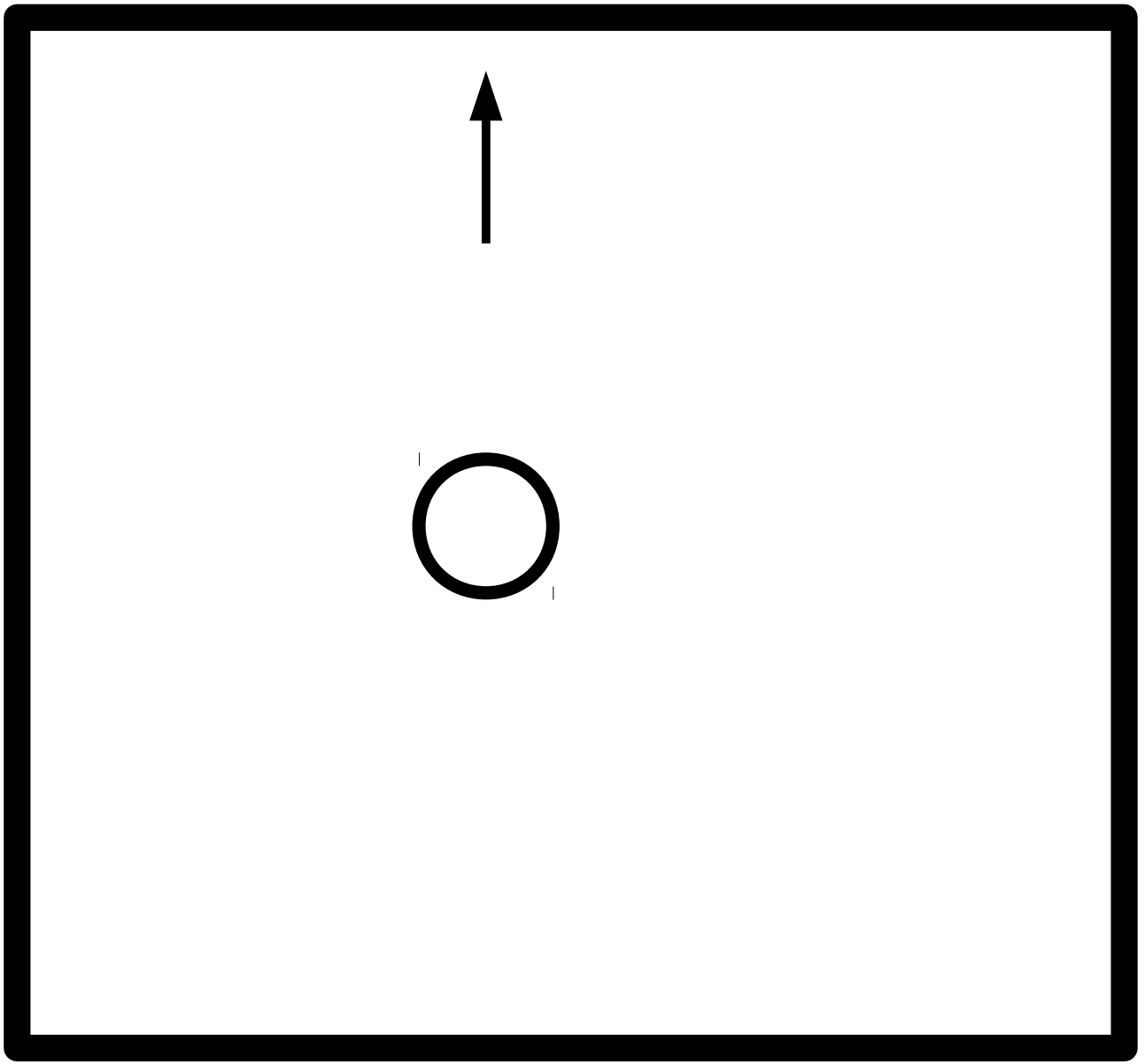


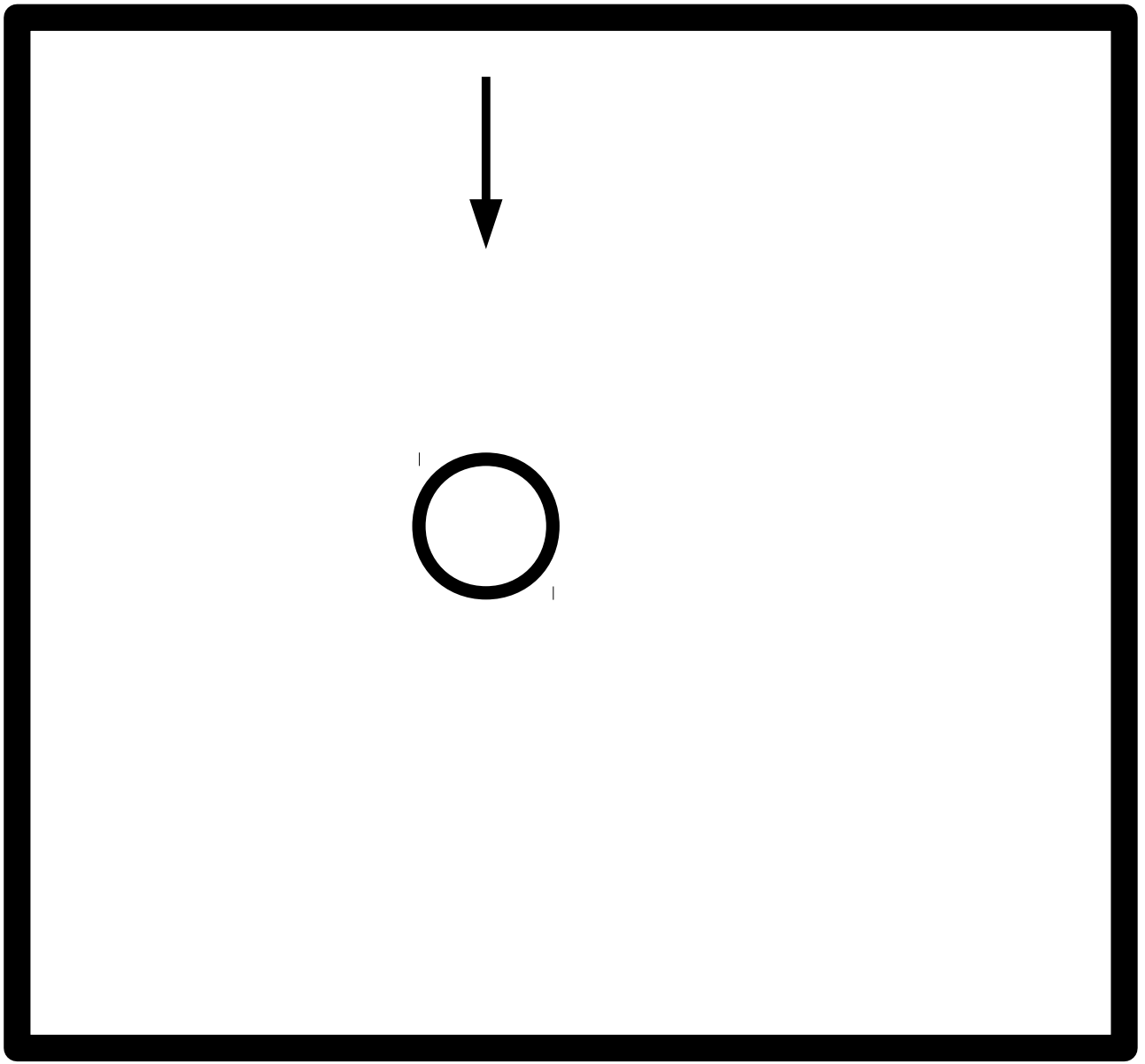


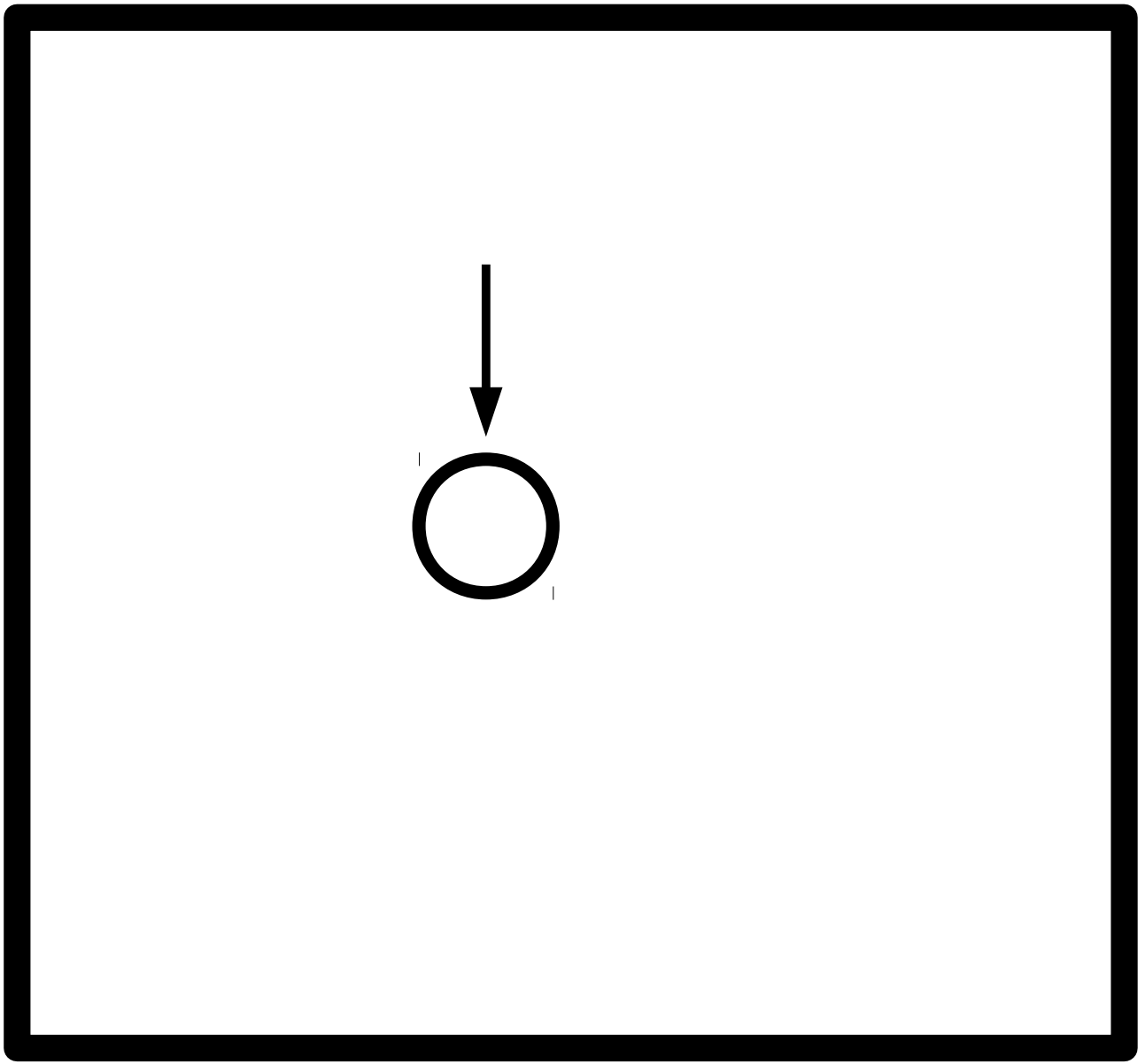


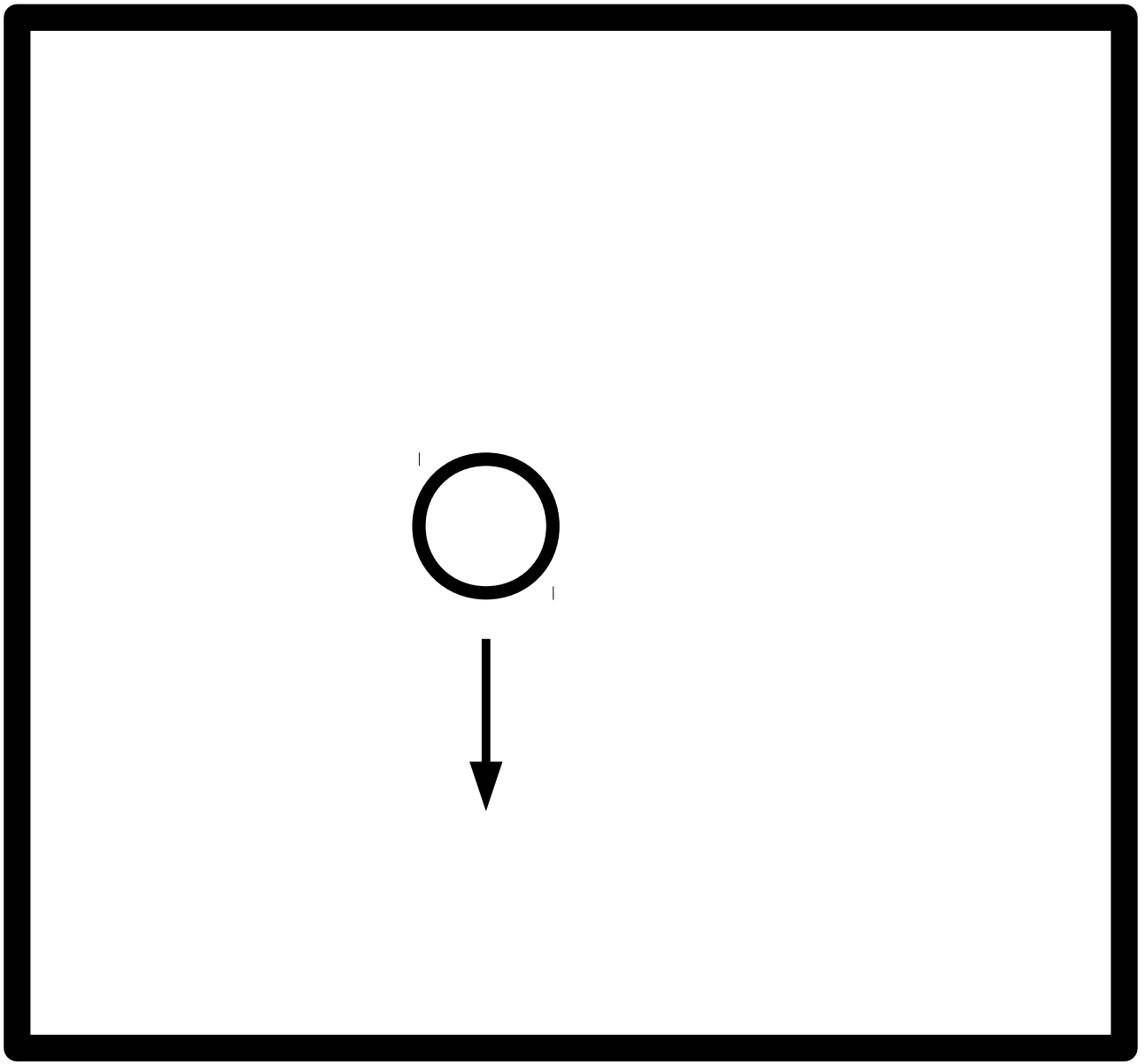












Trapping

Nontrapping

Trapping

Nontrapping

$$n = \frac{1}{c^2}$$

$$2n + \mathbf{x} \cdot \nabla n \geq \mu$$

Rays Escape

Nontrapping

Get bound

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2. Prove they work

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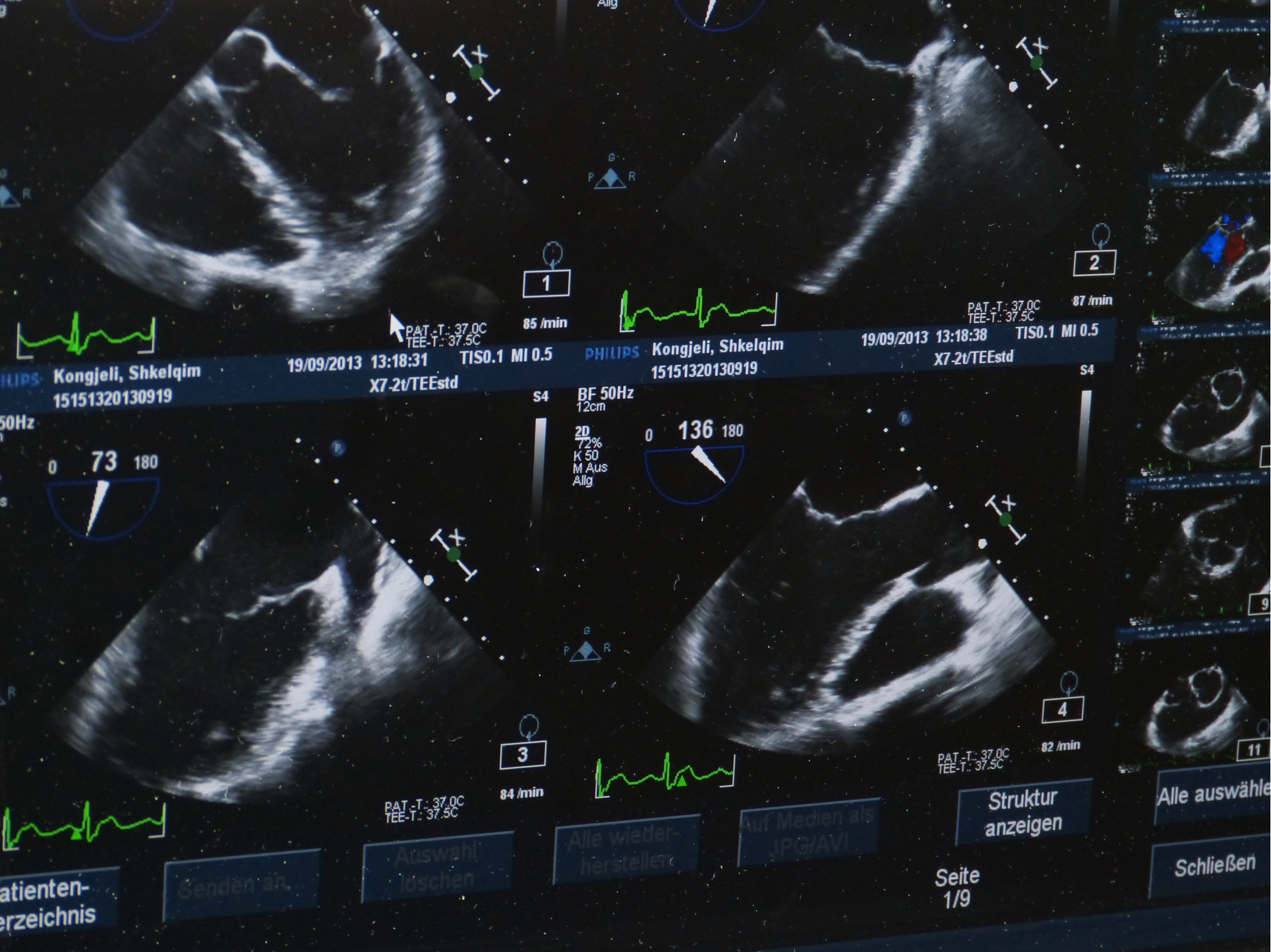
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Thanks!